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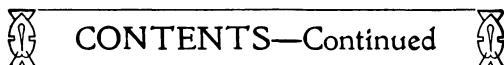
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## EXCLUSIVE CONTRIBUTIONS

### The Principles and Practice of Filling Teeth with Porcelain.\*

By DR. JOHN Q. BYRAM, Indianapolis, Ind.

#### Technique of Finishing and Setting Inlays.

After the fusing process has been completed, the matrix should be removed by gripping it with the lock tweezers and peeling the foil toward the center of the inlay. It may be necessary to catch the matrix at different points in order to loosen it at the margins. If the porcelain and the metal adhere firmly, this adhesion may be partially broken by placing the inlay and matrix in water for a few minutes, and the foil may then be removed more easily. If there were any perforations in the matrix, through which some of the porcelain has flowed, the adhesion will be greatest at these points, and it will be almost impossible to remove the matrix without some method of instrumentation. When these points of adhesion are somewhat distant from the margin the foil may be removed with a small stone or a dull bur; but if such points of contact are along the margin the metal should be removed with an excavator. Unless this is done delicately the inlay may be chipped along the margin. In order to prevent this chipping all scraping should be from the margin toward the center of the inlay. In case it seems inadvisable to remove a small piece of foil at the margin by instrumentation the inlay may be placed in hot *aqua regia* until the foil is dissolved.

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**Cutting  
Grooves.**

The inlay should be grooved after it has been separated from the matrix. This may be done best with a small diamond disk (Fig. 129), which may be used as a copper disk with carborundum powder after the diamond dust has worn off. The location and depth of the grooves depend upon the size and shape of the inlay. When the inlay is for a cavity on the labial or buccal surface, the groove should extend around its circumference near the base (Fig. 130A). If, however, the



FIG. 129.

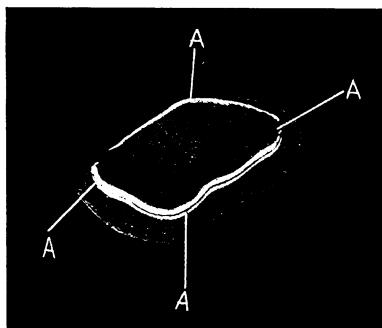


FIG. 130.

inlay is constructed for a simple approximal or approximo-incisal cavity, the groove should be formed along the ridge of the inlay that fits into the cavity (Fig. 131A). It is also advisable to make a groove along the seat extending in a labio-lingual direction. In all cases in which the inlay is grooved the cavity should be grooved in such a manner that the cement will fill the space made by the two opposite grooves, representing the tenon of a mortise joint. It is not necessary that these grooves be deep, but they should be cut so that the groove on the inlay and the corresponding one in the wall of the cavity will form one channel (Fig. 131B). Any margin of porcelain that may overhang the gingival wall should be removed with fine grit stones, and the surface should be polished with cuttlefish disks before the inlay is set.

When the inlay has been properly grooved it should be etched with hydrofluoric acid. To do this requires that the margins should be invested in wax (Fig. 132) in such manner that it is impossible for any of the acid to reach them. The investing is accomplished by making a depression in a block of beeswax with a warm spatula and inserting the inlay so that only the cavity surface will be exposed, a result that is best obtained by

searing the wax to the porcelain with a hot spatula. The acid is to be applied by dipping a pointed stick into the bottle and placing a drop on the exposed surface of the porcelain, where it should be allowed to remain from three to five minutes. The acid should then be neutralized by a solution of sodium bicarbonate.

It should be borne in mind that hydrofluoric acid is a solvent of both glass and porcelain, and that it must be kept in a wax or gutta percha bottle. This acid attacks living tissue violently, and in case it comes

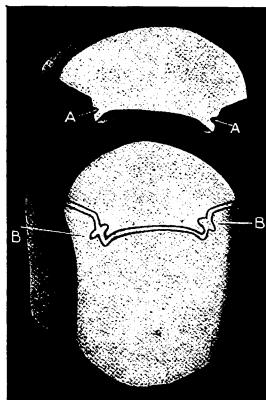


FIG. 131.

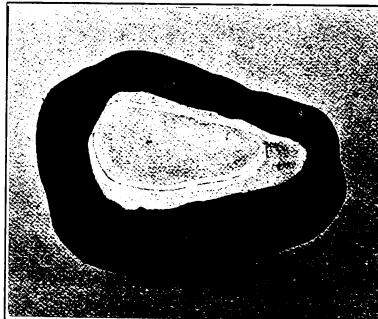


FIG. 132.

into contact with the flesh it makes a painful wound. Utmost care should, therefore, be exercised in handling the acid; but if it should get on the hands it should be neutralized *at once* with a solution of sodium bicarbonate.

The acid having been thoroughly neutralized the inlay should be removed from the wax and placed in boiling water for about five minutes. After this it should be thoroughly washed with chloroform to remove any wax that may still adhere to it. It is then to be dried with warm air.

**Setting The Inlay.** If, by judicious use of absorbents, the cavity can not be kept dry, the rubber dam should now be adjusted. It has been found that most cavities in upper teeth can be kept dry by placing a small napkin between the teeth and a roll of absorbent cotton between the lips or cheeks and the gums. After the cavity has been thoroughly dried it is then grooved with a small inverted cone bur. It should now be wiped with a pellet of cotton saturated with chloroform, and after this has been done it should be thoroughly dried with warm air.



The ideal cement for setting inlays would be translucent and very adhesive. But since it is necessary to use an opaque cement, the ideal kind not yet having been produced, the whitest that can be obtained is probably the best for setting all large inlays. When inlays are constructed of a monochromatic porcelain and are slightly lighter than the tooth, a cement that is the same color as the porcelain, but of a lighter hue, is the best for setting them, because the rays that are transmitted through the porcelain are not so freely absorbed by the cement, but are reflected to the surface with practically no change of color other than intensifying it. Pure white would be the best opaque cement for setting all simple approximal and approximo-incisal inlays constructed of a multi-colored porcelain, because white bodies do not absorb light, but reflect it. The same rays that are reflected to the cement would then be reflected to the surface for the reason that white has greater reflective power than any of the colors. Unfortunately the manufacturers are unable to produce a pure white cement. We can not, therefore, entirely overcome the change of color caused by the cement's dimly reflecting and partially absorbing the transmitted rays.

In order to obtain the greatest adhesiveness the cement powder and liquid should be mixed in definite proportions, and they should be spatulated thoroughly. The consistency of the cement is to be determined by its adhesiveness, and the operator should familiarize himself with the proper proportions of cement and liquid to yield the greatest adhesive quality. A large glass slab and a bone, ivory, glass or agate spatula should be used for mixing. The powder and liquid should be placed on the slab, each in a separate position, so that a small portion of the powder may be easily incorporated with the liquid. Moreover, small portions of the powder are to be added, and the mass should be manipulated as each addition is made, until there is the "feel" and appearance of complete mixture. After sufficient powder has been worked into the liquid, the mass should be spatulated thoroughly.

A thin film of cement should now be spread over the walls and margins of the cavity with a small bone spatula or a wooden point. After this a thin film is to be placed on the etched surface of the inlay, which should then be forced into position. If the cavity is on the labial or buccal surface the inlay should be pressed into place with soft wood or rubber, and then forced into absolute relation by tying a silk ligature around the tooth, making a surgeon's knot on the inlay. At this point in the operation care should be taken not to exert sufficient pressure to fracture the inlay. If the case is for a simple approximal or an approximo-incisal cavity the inlay should be inserted with pliers or the

fingers, and then forced into place with a strip of thin linen tape. The force should be exerted in such manner that the inlay will be rocked into position. After the surplus cement has been expressed the inlay is to be forced into its place by exerting constant pressure with the tape. If a hydraulic cement has been used the surplus should be moistened with water. If a non-hydraulic cement has been used it should be kept dry for ten or fifteen minutes, after which time remove the surplus and paint the margins with sandrac varnish.

Finishing the inlay should be accomplished as a subsequent operation, which should not be attempted until the cement has thoroughly hardened. Very little finishing will be required if proper care is exercised in applying the porcelain. All margins of porcelain overhanging the enamel are to be removed with fine grit stones (Fig. 5A), and the inlay should then be polished with cuttlefish disks and Arkansas stones (Fig. 5C). These stones should be kept thoroughly moistened and used with a moderate degree of pressure.

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## Iodin a Counter-Agent to Arsenic.

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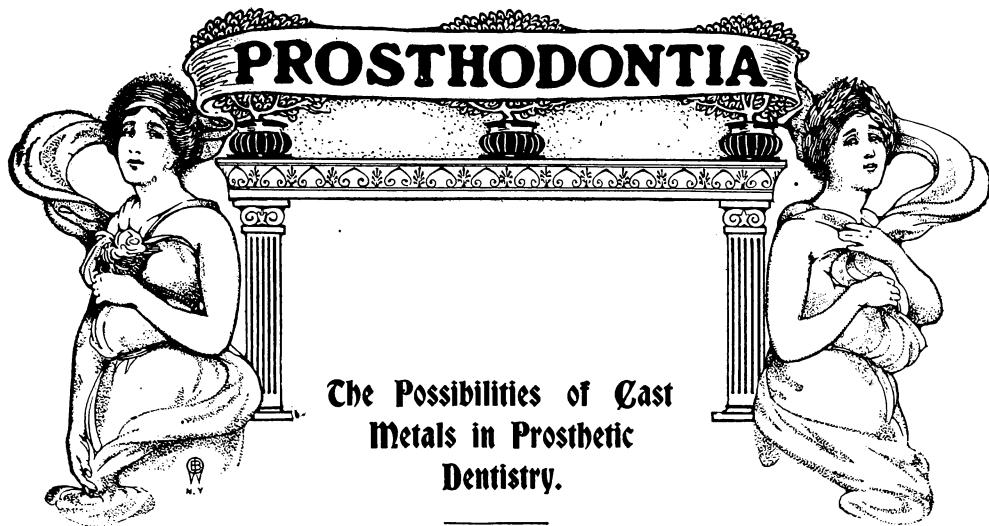
By DR. H. P. ZENDEL, Passaic, N. J.

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To stop the pain caused by the application of arsenic for pulp devitalization, I have had success with the counter irritations of iodin. It stops the most throbbing pain almost immediately. In a few cases I gave intentionally high pressure, yet iodin application proved to be of great value.

I apply the arsenic and cover as usual. I tell the patient to wait in my office for fifteen minutes; when the patient complains of pain, I wait five minutes more, then dry the gum and make the application of the iodin high up at the apex slight, and a stronger application at the gums of two adjoining teeth. The action is prompt. During my last years of practice I can remember four cases where I had to give a slight second application. I have tried using the iodin application right after the covering of the arsenic, but it was of no value.

My theory is that the inflammation comes from mechanical, and not from pathological, causes, and when the blood is drawn away by any counter irritation, the pulp absorbs the arsenic more quickly and gets at once paralyzed.



## The Possibilities of Cast Metals in Prosthetic Dentistry.

By WM. H. TAGGART, D.D.S., Chicago, Ill.

*Read before the Second District Dental Society, January, 1908.*

It was just one year ago to-night that I came to Greater New York and gave for the first time before any society my ideas about cast inlays.

The subject at that time was new, and what I gave you then you had, in a measure, to take on faith; of course, you had the specimens of work made by my methods to justify that faith and help you to accept what at that time was an innovation, but the liberality shown on that occasion, and the almost blind infatuation with which the profession accepted those ideas, have constituted a continual source of gratification to me during the past year.

During this time a large proportion of the profession have had occasion to verify the prediction I made at that time, that this process was no dream, but a practical and scientific reality; but I said, too, that it was no lazy or careless man's process, as it had within it mechanical and artistic principles which would draw out all the possibilities in the best of us.

I also predicted that it would immeasurably raise the standard of even inferior dentists, because they could accomplish one thing which they had not been doing, and that was to make an inlay fit the cavity.

Was I right? I will leave the answer to you.

The fact that the underlying principles which I gave at that time have not been changed nor improved upon, almost conclusively shows that

# PROSTHODONTIA

they were correct. Dozens of devices have been made, costing from thirty cents to one hundred dollars, but those principles which you so enthusiastically received one year ago, still remain.

To-night I will talk to you on a different application of some of those principles. The subject

## Prosthetic Pieces

### Cast.

is much older, and many more attempts have been made to cast prosthetic pieces than were ever made to cast inlays. The reason is plain. The prosthetic piece being made to rest against a yielding gum, does not require the accuracy of fit that is absolutely necessary in inlay work. That being the case, to make prosthetic pieces by casting was quite possible by several methods, but the application of casting as applied to bridge and crown work, which I will speak of to-night, requires the same degree of accuracy that inlay work does; consequently the same technique which is used in making cast inlays can be used in making cast bridges, cast crowns and cast plates, and my paper to-night will simply be an effort to show how nicely these inlay principles apply, and can be surely and practically used to the betterment of our prosthetic work.

To show you that I have the spirit of my convictions, I wish to tell you that in the past year I have not used one pennyweight of gold solder; everything in the nature of bridges and crowns where gold is used I have made by the casting process. In making such a decided change from former methods, I have earnestly tried to criticize the method and not allow myself to carelessly worship a false god; but, gentlemen, there is too much in the method, and it is too nearly mechanically and practically correct to predict for it anything less than that it has come to stay.

You need have no fear that my paper to-night will be a lengthy one, for when one has to perform the simple duty of stating facts it does not require much time, neither does it require any flowery eloquence to support or uphold facts, for flowers will droop and colors fade, but the mechanically correct principle properly applied is not of a transient nature.

Ever since the advent of bridge work it has

### Cast

## Bridge Pieces.

been necessary to use a great many sound natural teeth for abutments. If these teeth were properly prepared for crowns, it became necessary to sacrifice a large area of solid tooth substance, and also cause a great deal of pain, for if that tooth was properly prepared to receive a crown it certainly taxed the energy of the most robust of us. If it was not properly prepared, the gingival irritation would soon cause the loss of a good tooth.



Such teeth can now have cast attachments made which are certainly more firmly fastened to the tooth than a gold crown can be, and with the sacrifice of but a small amount of tooth structure, and that sacrifice of structure is from a part of the tooth which is not fatal to its life, and the integrity of the gingival margin has not been encroached upon.

The inlay attachment for a bridge is not a new idea; but made by the cast method it is so much more firmly attached to the tooth, and can so readily be made where a crown formerly was required, that I have no hesitancy in advocating it in teeth where it can be applied. Now, I wish to caution you to use judgment, and not try to make a poor little inlay, without proper size or shape, support a large bridge, for it will surely fail. But remember that a generous cavity can be cut in the approximal wall, and also across the grinding surface, with no fear of encroaching on dangerous territory; such a filling with two or three pins in it, which can always be so placed as to do no harm, is in my practice one of the most useful forms of attachment for a bridge.

We will take a common and typical case, the **Cast Inlays as Abutments.** second bicuspid and first molar gone, the first bicuspid and second molar without a blemish; formerly

it was necessary to crown these two abutments and make what we call a four-tooth bridge; now I make a cavity preparation in these two good teeth with generous sized carborundum stones and by placing two or three pins of No. 18 or No. 19 gauge iridio-platinum wire in holes drilled in parts of the cavity which are not near the pulp, these along with the surface contact, which can only come with a cast inlay, make an attachment which has a much firmer hold on the tooth than a crown has and does not have the gingival irritation which is usually present in banded crown work; neither has enough enamel been removed to cause shock to the pulp. In the preparation of these cavities for inlays it is also much easier to make parallel walls than it is to make parallel abutments in crown work.

After the inlays are cast and properly finished, they are put into the cavities and driven home. I say "driven home," for they fit every part of the cavity so perfectly that it requires some force to seat them. An impression in plaster of Paris is taken and also a bite. The inlays are removed from their cavities and properly placed in the impression, and an investment compound model is made, and the whole mounted on an articulator.

The dummies between these two inlays can now be made in several ways by using flat back facings and carving wax cusps and backings, and casting the gold directly on to the porcelain; or, using flat back facings

and having the pins perfectly parallel, build up the cusps and backing in wax, and before flasking carefully remove these facings, and in the pinholes made in the wax by the tooth pins insert small leadpencil leads, such as are used in vest pocket leadpencils. These should be one-quarter of an inch long, and when these wax dummies are flasked ready for casting the leadpencil leads are held in proper position by the investment, and the gold is molded around them, after which a proper sized drill or bur will remove the lead, leaving clean and properly placed holes for the facing pins to be cemented into. These wax dummies are properly shaped to rest against the gold inlays at either end, and if the contact of wax against inlay is carefully made the dummies can be easily lifted off the model and cast in gold. If everything has been properly done the cast gold dummies will go back on the model just as the wax did, and being an investment compound model the dummies can be soldered to the inlays with the minutest quantity of solder, as there is no building up to be done, and the two parts have to be simply sweated together. Making a bridge in this way there is not the danger of warpage as there is when large quantities of solder are used as in former methods.

My ability to cast gold directly against the por-

**Casting Gold**

**Directly on  
Porcelain.**

celain seems to have been somewhat misunderstood, judging from the advertisements of manufacturers of casting machines. Last year I did not advise it owing to the danger of checking porcelain, and one machine is just as liable to check porcelain as another; but the minimum amount of danger rests entirely with the man and not the machine. By carefully and thoroughly heating the flask the risk is not great, and in my machine, always having an excess of heat coming from the nitrous oxid flame, I am in a position to heat these flasks more thoroughly than by any other mode of applying heat.

Another method of making the dummies is to use any of the all-porcelain crowns, such as the Davis, White, Justi or Brewster, and making a frame of wax, cast it in clasp metal, which makes a very stiff frame with the minimum of gold.

If one wishes to make a bridge using gold crowns for abutments, it can be done in the following manner:

After the roots are properly trimmed a well-fitting narrow band of platinum is made for each root, an impression in plaster is taken, also a bite, and on the articulator the wax can very artistically be carved to shape and proper occlusion, and when molded in gold the platinum does not show and is absolutely stiff and strong, and if any artistic ability has been displayed much better and more properly contoured gold crowns can be made in this way than by any method I know.



## ITEMS OF INTEREST

Leaving the mode of forming the bridges to each one's own judgment, I will now briefly refer to crown work.

**Cast Gold  
Crowns.** For artistic and mechanically correct gold crowns I think the casting process has no equal, and the speed and ease with which proper occlusion can be obtained recommends it above all other methods at the present time. A very strong and beautiful crown can be made by using any of the all-porcelain crowns with their pins and making the joint between the crown and root with wax, carefully remove the same, cast it in gold, and you have a joint between the crown and root which is like an inlay; in fact, if the root is badly decayed you get an inlay effect wherever you have forced the wax, and all made with but a few minutes of the valuable time of the dentist, which, while an item to be considered, is nothing as compared to the fact that it is, in my opinion, the strongest and best crown which can be made at the present time.

**Casting  
Plate Dentures.** I will but briefly allude to the possibilities of casting in plate work, and I am finished. I believe the necessities for dies and counter dies in all partial cases is a thing of the past. After a correct model is made in plaster, a gold partial plate can be made in less time than it takes to make a vulcanite case for the same place. Take those partial lower cases which are always hard to fit; you saw me this afternoon consume not over fifteen minutes of time in making perfect fitting and strong bases on which vulcanite teeth can be set. Clasps can be made in a few minutes. In fact, gentlemen, there seems to be no end to the application of casting precious metals for dental uses except the limitations of the dentist himself.

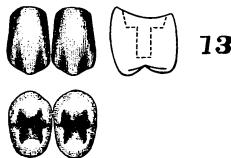
The process has certainly revolutionized my practice, and it will yours. It is essentially an old man's process, because it makes the arduous work easy and permits him to do better work than he ever could when young.

It is essentially a young man's process, because it makes it possible for him to practice his profession with none of those hardships before him which we older ones have had to contend with. In other words, it is an old dentist's process because he has so few years to live, and it is a young dentist's process because he has so many years to live.

## A Plea for More Scientific Forms of Artificial Teeth.

## Editor ITEMS OF INTEREST.

Dear Sir—Having read your editorial in January ITEMS OF INTEREST and many letters from well-known dentists since then on "Improved Forms of Artificial Teeth," I would say I have been articulating artificial teeth since 1870, and for many years I used gum instead of plain vulcanite teeth, and by having *many* molds and *few* shades, I succeeded in getting proper articulation by doing several hours' work per set. I now use almost exclusively plain teeth, and by some study I get very good articulation by the Bonwill method. The greatest trouble I find is in the



cuspids and bicuspids, which are not thick enough. In cross section they should be made more like a condensed letter O, which will make large grinding surfaces, yet not take up so much room on small models as the thin round forms so generally made. The cusps of grinding surfaces should be cut deep with well defined sulci, instead of the smooth surface found on most of the bicuspids and molars as usually made. I find some good molds made by the Consolidated Dental Mfg. Co., which I am using with good satisfaction. I use ten molds of upper bicuspids and three shades. Number of molds 45, 49, 62, 68, 69, 71, 90, 92, 96 and 97. This gives me a variety of sizes and lengths and some with long inner cusps, and others with short inner cusps. I then have on hand the following upper sets of sixes: Ten molds Nos. 21, 30, 53, 62, 68, 79, 88, 90, 91, 96. By having a large assortment of above numbers and *few* shades they can be interchanged when articulating with excellent results. I get along with six lower sets or molds of bicuspids and molars as follows: Nos. 6, 14, 41, 71, 92 and 96. I use lower front molds Nos. 25, 50, 65, 73, 75 and 92, which can be interchanged with the bicuspids and molars, as the case may require.

While the above teeth are the best I have been able to find, yet I could do more artistic work if the bicuspids had more surface, as shown on page 90 and mold 13 in the Davis Crown cuts in the Consolidated Dental Mfg. Co. tooth catalogue. You will see how condensed No. 13 is, yet it has a large grinding surface which can be used on small models. The present method of making the bicuspids round instead of elliptical



precludes the use of the present large bicuspids for small models. The molar teeth should have large grinding surfaces and deep cut, yet should be shorter than most of the large molars which are furnished at present; the second molar in both upper and lower should be much shorter than the first molar. In articulating I always place the upper cuspids in the proper place, then select bicuspids and molars large enough to fill out almost as far as the plate is to go, and then select the six front teeth after all the bicuspids and molars are carefully articulated.

We should keep one hundred or more sets of teeth on hand at all times so as to get good results.

Hoping some tooth manufacturer will accept advice from one who has articulated thousands of sets of teeth, I am,

Very truly yours,

W. T. WALLACE.

Henderson, N. C.

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Editor ITEMS OF INTEREST.

Dear Sir—I have read with much interest the recent discussions in ITEMS OF INTEREST of the need for improvement in the forms of artificial teeth.

I have often wondered just what causes led up to the adoption of the present forms and the abandonment of the more nearly natural forms found in the old molds of the countersunk pin teeth.

In a recent article in the *Dentists' Magazine*, Dr. George Wilson says substantially that "by reason of the fact that the stress of mastication, where artificial dentures are used, is only about one-fourth as great as with the natural teeth, the manufacturers have shown wisdom in making molars and bicuspids smaller, thus concentrating the stress on a smaller surface."

Now, that may be eminently desirable where the teeth are set on the plane-line articulator, where only an up and down movement is available, but as mastication of food is best performed, as Nature intended, by a triturating, rotary movement, a broad occlusal surface with the natural curvature of alignment would seem more efficacious. A stamp mill is all right for crushing quartz, but a millstone would make better flour.

The catalogue of one manufacturer contains the following, which is illuminating, "The manufacturers' indication of what is wanted is shown by his record of sales." All thinking persons will agree that vastly more teeth are sold to the advertising "parlors" than to the profession. With rare exceptions these places use only the plain hinge

## PROSTHODONTIA

articulator, and set the teeth without the anatomical curve, as it can be done more quickly and with less attention to detail.

The customers are instructed to learn to chew with the up and down movement, using both sides at the same time. As they know of no better way, they put up with the discomfort as a necessary evil.

I believe that we have here a subject which should engage the attention of all members of the profession. It should be discussed in the various meetings and in the journals until all are awakened to the need of new forms. Representatives from all the state, national and international societies should be selected to design a series of models which would meet modern approval.

Every dentist should make his wants known and not buy without protest whatever happens to be in the trunks of the salesman.

Whenever the demand for change is sufficiently large to warrant it the manufacturers will accede to it gladly.

LANDIS HIXON WIRT, D.D.S.

Muncie, Ind.

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### Editor ITEMS OF INTEREST.

Dear Sir—Let me give expression of indorsement of a change in the forms of artificial teeth as set forth by J. Leon Williams.

If a systematic effort is made by progressive dentists as a body the desired results will be attained.

If the response in this manner is not sufficient to create the change let society meetings give expression as a body, and if the demand is long and loud the change must come.

Truly yours,

A. L. HARTER.

Kokomo, Ind.

---

### Editor ITEMS OF INTEREST.

Dear Sir—The letters of Dr. Williams and your editorials on the needed changes on tooth forms have been brought to my notice, and I wish to add my name as an additional unit in the request for such improvements. The greatest needs, in my opinion, are the size of the lower incisors, the too great convexity above downward of the anterior teeth and the shape of the bicuspids and the molars.

Very truly yours,

W. A. JAQUETTE.

Philadelphia, Pa.



## The Genesis of the Blood Supply to the Teeth.

By I. N. BROOME, D.D.S., Philadelphia, Pa.

*Read before the American Society of Orthodontists, at Detroit.*

In presenting this subject I do so with the belief that the successful work which the orthodontist is called upon to perform depends largely upon a preservation as nearly as possible of normal physiologic and anatomic conditions in the teeth and in their surroundings, and nothing can be more conducive to this than an attempt to reduce to the minimum the possibility of interference with the vascular supply.

I must confess that I have not been able to keep pace with the literature pertaining to the theory and practice of modern orthodontia, but in days gone by very much was said about the possibility of interference with tooth generation and growth in attempts to "straighten the teeth" through a pinching or strangulation of the blood current. I do not know just what the opinion of the scientific orthodontist of to-day may be regarding the possibility of permanent injury to the teeth through vascular strangulation, but I have been assured that it is not infrequently considered as a possibility.

It must be acknowledged that a free and unhampered blood supply is the one thing essential when the development of an anatomic structure is taking place, and the more complex the organism the more complex and abundant the anastomosis of the capillaries supplying the parts.

This being the case, it should be borne in mind that hypertrophy or overgrowth may result through over-stimulation of the blood current while a diminished blood supply is no less harmful through the possible atrophy or complete destruction which may follow.

One of the older writers on the subject of orthodontia says: "Aside from the mechanical difficulty of moving the teeth, the greatest care must be exercised, for they are tender organs, and devitalization may easily result from pressure." It is known that destruction of the pulp of a



FIG. I.  
Blood Supply According to Harris.

fully developed tooth or the papilla of a growing tooth, can only be brought about by an interference with its blood and nerve supply, and it was this thought which prompted the preparation of this paper, intended to embody a consideration of how young, growing teeth are supplied with blood, and of the relationship which exists between the tooth and its vessels during this period.

Most of the illustrations to be shown are reproductions from a number of dissections made upon human jaws, as well as upon the jaws of the calf and sheep, the result being to establish a belief that the early blood supply to the teeth is a circulation so within itself, that little harm can result from the generous pressure employed in modern orthodontia.

While the dissections establish beyond a doubt the nature of the blood supply to the tooth germs, and the growing and developing roots of young teeth, at the same time they introduce a perplexing anatomic feature which is not thoroughly understood by the writer, and which I trust will receive generous discussion at your hands.

# ITEMS OF INTEREST

In order to bring the subject clearly before you, and at the same time by comparison introduce the perplexing anatomical feature spoken of, it will be necessary to call attention to some illustrations, old and new, showing the blood supply to the fully developed teeth.

## Views of Previous Authors.

Fig. 1. The first illustration is taken from Harris's "Principles and Practice of Dental Surgery," 1850. A portion of the descriptive matter accompanying the same reads: "The inferior dental artery

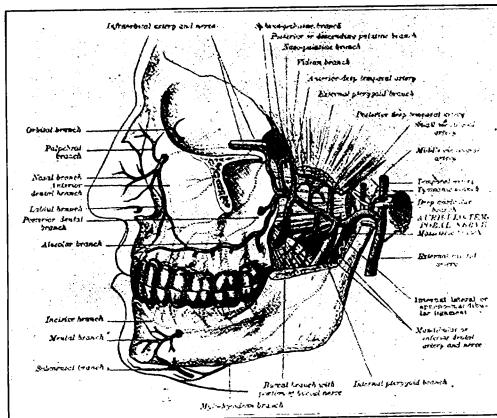


FIG. 2.  
Blood Supply According to Morris.

passes along the dental canal beneath the roots of the teeth, sending up a twig to the aperture of each root."

Fig. 2 is reproduced from the last edition of Morris's Anatomy, and is described in part as follows:

"The inferior dental artery passes along the canal in the interior of the bone and gives off branches to the molar, bicuspid and canine teeth."

It will be noted that to a certain extent this diagrammatic illustration is erroneous, giving the impression of three roots to the lower molars and two to the lower bicuspids.

Fig. 3. The next illustration, taken from Da Costa's most recent work, is described in part as follows:

"The inferior dental artery courses through the substance of the bone and gives off a few twigs, which are lost in the cancellous tissue, and a series of branches, which correspond in number to the roots of the teeth."

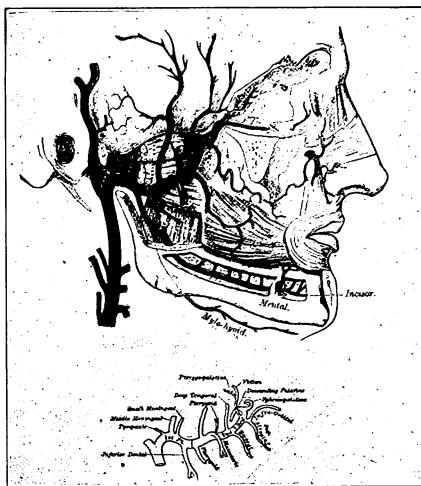


FIG. 3.

Blood supply according to Da Costa.

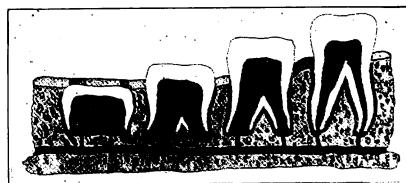


FIG. 4.

Blood supply according to Constant.

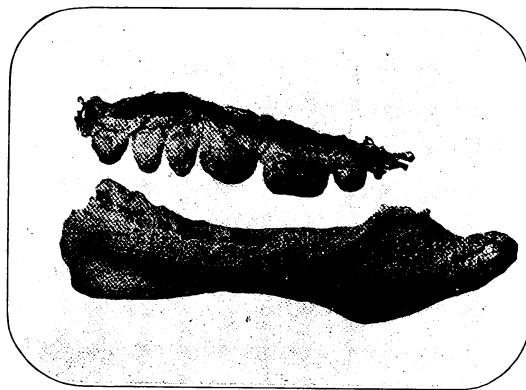


FIG. 5.

Mandible from fetus—fourth month. Tooth follicles  
lifted from bony sockets.

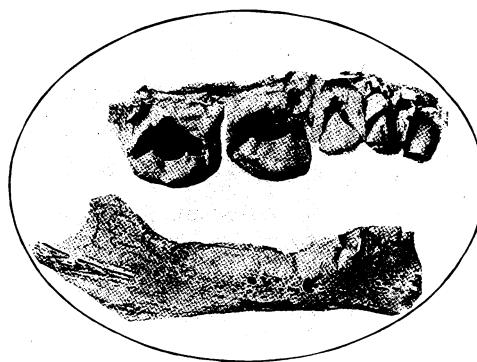


FIG. 6.

Mandible with follicles dissected out.  
Sixth embryonic month.

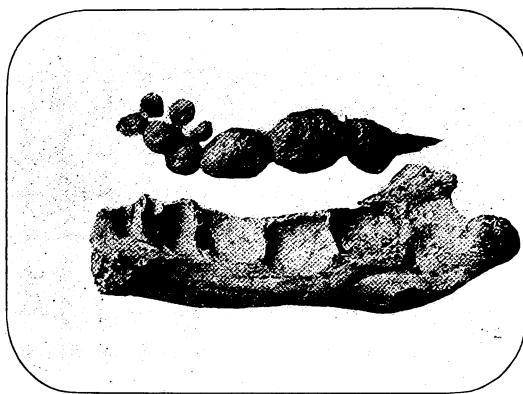


FIG. 7.

Mandible with follicles dissected out.  
The specimens are turned to show the bases of the follicles  
and bottoms of the crypts.

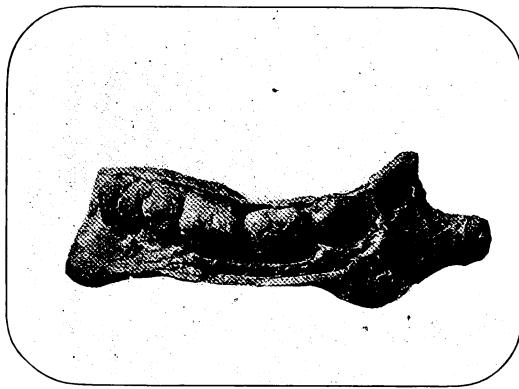


FIG. 8.

Mandible of child, one month after birth. Crowns calcified  
at this period. Dissection shows follicles and  
discloses mandibular canal.

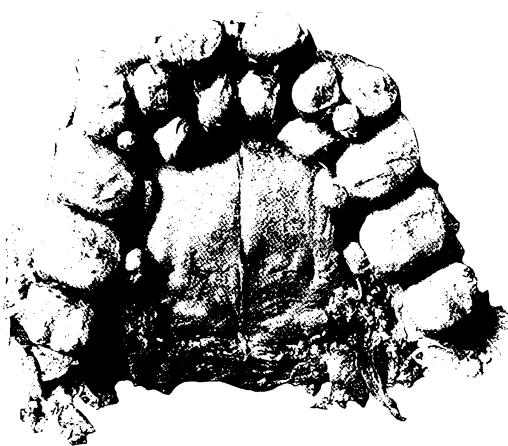
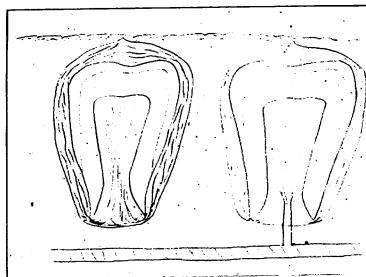


FIG. 9.

Dissection of soft tissues from hard palate and maxilla of a child. Follicles of both deciduous and permanent teeth lifted from their crypts.



A B

FIG. 10.

Schematic diagram of blood supply.

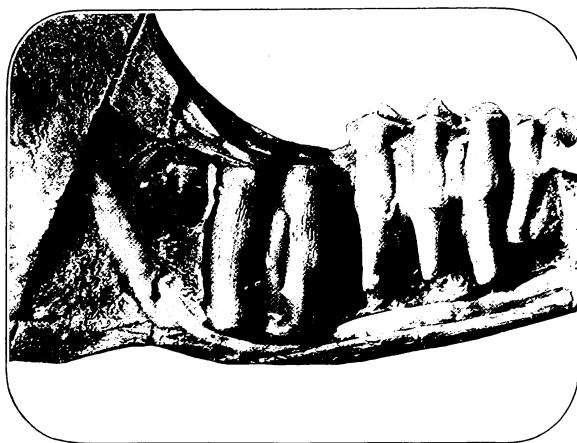


FIG. 11.

Dissection of mandible showing teeth in advanced stage of calcification, and also follicular stages.



FIG. 12.

Same as 11. Large follicle dislodged.

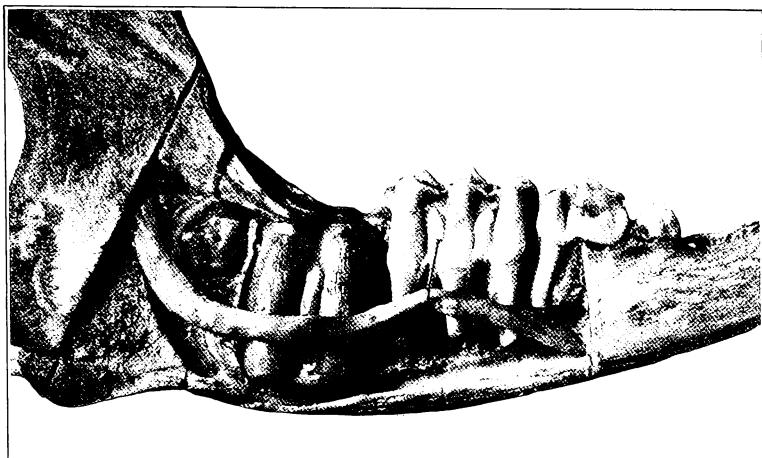


FIG. 13.  
Same with sheath lifted out of canal.

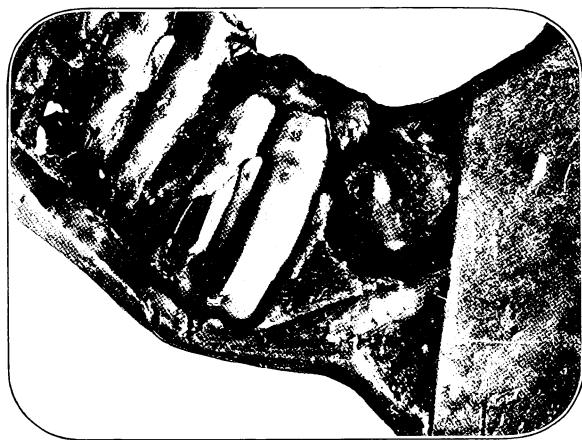


FIG. 14.  
Similar dissection on older subject.

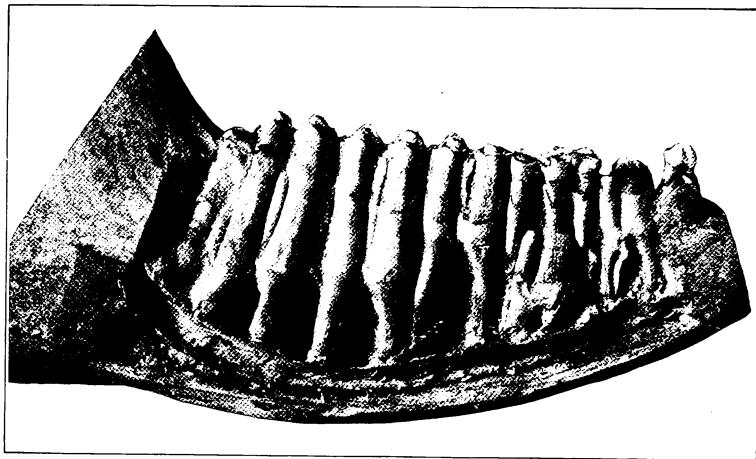


FIG. 15.

Dissection of mandible of an ox. Sheath dissected away  
disclosing artery.

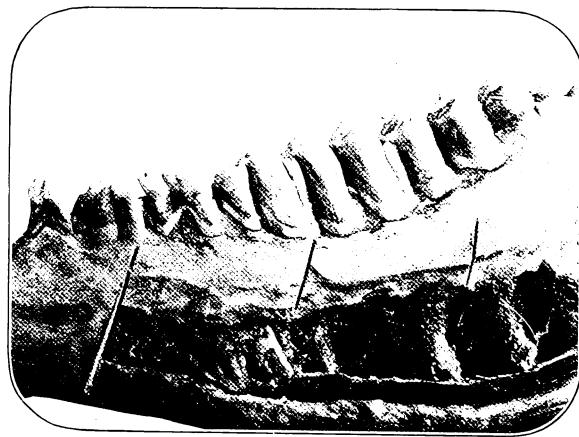


FIG. 16.

Showing roof of mandibular canal.



FIG. 17.  
Vessels in follicles injected.



FIG. 18.  
Showing secondary sheath branching from mandibular sheath,  
and passing forward over tops of follicles.



## ORTHODONTIA

Here again the illustration is misleading, as there is but a single branch for each of the eight teeth.

In a general way all of these authorities agree as to the ultimate mode of a vascular supply to the teeth, but none of them throws any light upon the distribution of the blood to developing teeth.

If we recognize the foregoing as the final anatomical arrangement of the blood vessels supplying the teeth, I will venture the assertion that the manner by which such a distribution is brought about is most mysterious, after a careful study of the various dissections (illustrations of which are to follow) are carefully taken into consideration.

Permit me to introduce a drawing by Constant (Fig. 4), so frequently employed in text-books to illustrate his theory that the blood pressure is responsible for the elevation or eruption of the teeth.

To this arrangement of the blood supply at this time I purpose to take most emphatic exceptions, and hope to prove that no such arrangement of the blood vessels as shown on the diagram exists in the young or partly developed tooth crowns. While blood pressure may and likely does exist, as a controlling influence over the eruption of the teeth, it is not by any such simple arrangement as that here shown by Constant.

In addition, I quote and take exception to the theory and belief of W. Lepkowski, which are as follows:

“In the fetus of seven months the alveolar artery provides one branch for each tooth germ, which is thus entered at its base. The artery before its entrance into the sac, is still to be recognized as such.”

I take exception to this statement, because it is incorrect.

I believe that no apology is necessary for introducing at this time a few old slides made from a series of dissections upon human embryos and originally used in the study of the follicular stage of tooth development. These should be especially permissible at this time, because it was while these dissections were being carried on that the thoughts included in this paper were first presented to the writer.

**Dr. Broomell's  
Views.**

Fig. 5 shows a dissection made upon the mandible of a four-months' fetus, the object being to separate all of the soft tissue from the growing bone.

In making such a dissection as this for the purpose intended, it is essential that the incision along the base of the bone be made deep enough to include the periosteum; otherwise the tooth follicles will be more or less mutilated in attempting to lift them from the bony incasements.

The illustration shows the dissection complete, the bone and soft



tissue being separated, and in this we have the first opportunity to introduce the essential features of the subject under consideration, which are as follows:

*At this stage in the process of tooth development there is no connection between the inferior dental artery, already located in the substance of the bone, and the growing teeth.* There is no such condition present as described and diagrammatically illustrated by Constant and others. It may be argued that the process of growth in the teeth has not advanced sufficiently to expect the distribution of a special arterial branch to each follicle, or it may be said that these branches are present at this time, or have been broken off during dissection.

To contradict the former, this slide (Fig. 6) is introduced, and it will be seen that the crowns of the teeth are advanced to a stage equal to those showing the early stages in Constant's diagram, or about the sixth embryonic month, while the next slide (Fig. 7) shows the base of the follicles, as well as the bottoms of the crypts from which they have been dislodged. Yet there is no evidence in the picture of the passage of the blood vessels from the main artery to the individual teeth.

I might pause here to explain that with the most careful search instituted at the time of making these dissections, there was not the slightest evidence of a blood supply being given to the follicles by branches from the main artery.

Fig. 8 shows the mandible from a child one month after birth, at which time the crowns of the deciduous teeth are fully calcified. The inferior dental canal, devoid of its contents, is shown, and the relationship between it and the tooth follicles is clearly evident.

Even at this stage in the general development of the parts, no vascular communication has been established between the main artery and teeth.

Fig. 9 shows a dissection of the upper jaw and hard palate of a child, and exhibits the follicles of both the deciduous and permanent teeth, the soft tissue having been lifted from the bone and turned over. These follicles were not tied down to the bone by vessels, nor was there any evidence of vessels entering through the bone.

To make the subject more readily understood and to present what is believed to be the true condition, a diagram has been prepared, Fig. 10, "B," representing the established theory of Constant and others; "A," what is believed to be the real conditions as found by the writer in the numerous dissections made.

In the former the blood supply is seen to come from below by a single arterial twig. In the latter it comes from above by many minute

vessels which arise in the gingival tissue, and find their way into the pulp after coursing through the walls of the dental follicle.

In this connection it is well to recall the fact that the separate tissues of the developing teeth, and the connective tissue walls which surround them, are supplied by separate sets of vessels. That is, those tissues of epiblastic origin are supplied by a superficial set of vessels, while those of mesoblastic origin, which include the walls of the follicle and the dental papilla, are supplied by a separate and distinct set of vessels.

It is also known that with the transformation of the walls of the follicle into the alveolo-dental membrane there is established a free anastomosis between the two sets of vessels, and not until that time is the permanent vascular supply to the teeth fully complete.

Not being content with the dissections just shown, which were made several years ago, and to more fully establish the theory here advanced, I have recently made some dissections upon the jaws of the calf, results of which will now be shown.

Fig. 11 shows a dissection upon the molar region of the mandible, which exposes to view some teeth well developed and others yet in the follicular stage.

The mandibular canal is laid open and the common sheath is shown. It will be noticed that while the sheath is in very close relationship to the base of the developing teeth, there are no communicating vessels between it and the follicular walls. This applies to the molar, with its entire crown calcified, as well as to the younger teeth in which no calcification has taken place.

Fig. 12 shows the same dissection with the large follicle dislodged from its crypt, this being done without the rupture of blood vessels, which could not be the case if they existed as described by Constant.

Fig. 13 shows the common sheath pulled out of the canal, and serves further to prove the theory that there is no communication between it and the growing teeth.

Fig. 14 shows a similar dissection made upon an older subject, with like results.

While no attempt has been made to study the subject from microscopic sections, is it not strange that out of the thousands of longitudinal sections made of developing teeth and tooth germs and their associated parts, not one of these, so far as my observation goes, includes the walls of a vessel passing from the main artery to the root apex or base of the papilla? We see the main artery in transverse section near by, but the connecting vessel is always absent. It may be said that these blood vessels are not of sufficient size to be observed with the naked eye and



that microscopic sections should be depended upon only for a general study of the subject. These thoughts occurred to the writer, and for this reason some dissections were made on the mandible of an ox. In this the common sheath carrying the blood vessels and nerves of the mandibular canal measures three-quarters of an inch in diameter, and the lumen of the artery proper measures about three-sixteenth of an inch.

Hopewell Smith claims that the blood vessels of a human cuspid pulp are microscopically visible, and if this be so, they would be proportionately larger before entering the pulp, and very much larger in a jaw having the dimensions of those of an ox.

The next illustration, Fig. 15, shows a similar dissection made on the mandible of an ox, with the common mandibular sheath dissected away, exposing to view the artery, the same having been previously carefully injected. While several minute branches are given off, these do not correspond in position or number to the root apices.

Fig. 16 is a view of what might be called the "roof" of the mandibular canal, the same being in immediate contact with the root apices. In this specimen, somewhat incomplete, the mandibular sheath and its contents have fallen away, simply from lack of support. The open end of an incomplete root is shown, but no vessel penetrates it from the main artery.

As stated elsewhere in this paper my belief is that during the follicular stage of development, the papillæ or future pulp is supplied by vessels which reach it after coursing through the walls of the follicle.

Fig. 17 shows these vessels in the walls of the follicle after being injected, this injection having been made into the mandibular artery, and having reached the minute vessels in the walls of the follicle, the query naturally presents itself as to how this could be brought about if there be no connection between the two? This complication prompted a further dissection, the results of which are shown in Fig. 18.

Here we have shown a condition which would practically seem to prove the theory advanced. A secondary sheath given off from the main sheath and passing forward over the crowns of two developing teeth, and providing in this way a vascular supply to these follicles. Inasmuch as this sheath could not be traced beyond the two follicles shown, it is natural to believe that it has but a transitory existence and that it atrophies soon after the eruption of the teeth. It must be born in mind that this sheath is not a part of the gingival tissue, but has a separate and distinct existence, forming a canal for itself in the upper portion of the ramus of the jaw.

**Conclusions.** The blood supply to the dental follicles and growing teeth differs from that of the completely formed teeth in the mode of its general distribution. That is, while a blood vessel or single arterial twig *may* enter the apical foramen in the fully developed tooth, passing directly from the main artery in doing so, the blood supply to the tooth previous to this time is, as described, from the walls of the follicle, independent of the main artery.

The theory of Constant and others regarding the genesis of blood supply to the teeth is erroneous. Mature teeth are supplied with blood by branches from the main maxillary arteries, but this supply is received through the numerous common vessels which traverse the cancellated bony tissue of the jaw and the alveoli, forming a free anastomosis, some of the vessels of which enter the pulp through the root apex.

The practical bearing which this paper may have to the orthodontist is only such as may be applied when this difference in the early arrangement of the blood current is understood and generally accepted.

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### Discussion of Dr. Broomell's Paper.

**Dr. Pullen.** I consider this paper one of the most important that has ever been presented before this society in the scientific data obtained by actual dissections, and because of its subject matter. In my opinion the genesis of the blood supply to the teeth is of more importance to us than to the general practitioner, for we are dealing every day with developmental conditions in our study and practice.

The photographs show such perfection in the dissections that there can be no doubt as to the scientific value of the work done; and the conclusions drawn are logical and bound to revolutionize the ideas on the subject which have been heretofore held.

**Dr. Ottolengui.** Mr. President and Gentlemen: I feel very proud that the society could have a paper of this kind, and I feel very proud of the fact that, in a sense, Dr. Broomell has done such beautiful work for us, and for me. You heard him say this work was begun some years ago; part of it was done at that time, and a good part of it has been done especially for our society, as you have seen. Now I think the origin of this paper, if I am not mistaken, arose a number of years ago when Dr. Rhein, of New



York, asked me my views on the blood supply. I had not any at that time, except that I doubted the prevailing views as expressed by diagrams. I ask you to compare that sort of evidence with what Dr. Broomell presents. Dr. Rhein explained to me the purpose of his inquiry, which was that he had conceived the idea that in diseased conditions of the pericemental tissue (such as pyorrhea) the pulp having finished its functional work, might be removed in order to give a greater supply of blood to the pericementum; but of course if the blood supply came in through a vessel which entered the apex, and traced upward or downward to the main artery, the extirpation of the pulp would merely mean the retraction of the broken arteriole, and the purpose of affording additional blood to the pericementum would not be attained. I sent out this problem to a number working in this field, among them Drs. Broomell, Williams, Black, Suddust and others. Their views were published. They were carefully stated, but largely unproven. None really accepted the diagrammatic explanations of the text books. Dr. Broomell then undertook to discover what is really true. So you will appreciate this paper when you realize that the work has covered a great number of years. The final work has been done in answer to our request.

As soon as Dr. Rhein received the encouragement of the scientists in the profession, he began following the new treatment. He has kept a tabulated history of cases which he has treated by pulp extirpation, and it is now an established fact, acknowledged by the profession, that the pulp may be purposely destroyed in a tooth suffering from disease, with advantage to the pericementum; so that it appears that this view that the blood supply is reflected from the vessels in the pericementum has the support of clinical experience.

Now it remains for us as orthodontists to add this knowledge to our work and to rely on it. For example, it makes a difference in accelerating the eruption of a tooth to know whether we are stretching an arteriole in bringing the tooth down or up, or whether we bring the arterial supply down with the pericementum. If we are to move teeth it is absolutely essential we should understand the blood supply.

In taking my seat I can only express the wish that the second half of this paper will come to our society, because I do not believe there is a society in the world that would appreciate it more. I want to thank Dr. Broomell personally and from the bottom of my heart for the beautiful work he has done, and to say I have never seen better dissections, photographs and slides, and more absolute proof of facts claimed, than he has given me to-night. I think it will revolutionize the teaching on this subject.

**Dr. L. P. Bethel,**  
**Columbus, O.**

We all know that Dr. Cryer some years ago made extensive investigations regarding the internal anatomy of the face, etc., and brought to light information that was a revelation to the profession, but it has remained for Dr. Broomell to further investigate and bring to our notice the true conditions of the genesis of the blood supply to erupting teeth.

Dr. Ottolengui has spoken about the conditions in so-called pyorrhea, but it seems as though Dr. Broomell's discovery is of especial interest to the orthodontist from the mechanical standpoint that the blood supply coming in this way instead of from a distinct artery entering the apex, there is less liability of disturbance to the pulp during movement of the teeth—that is, the careful movement of the teeth and in the extent of such movement.

There have been a number of cases reported of death of the pulp through tooth movement, particularly through rotation, and some through elongation, but as I understand it, they were cases where there had been forcible elongation or too rapid rotation, probably accompanied by a rupture of fibers of the peridental membrane. These cases would, indeed, do more to confirm the idea of Dr. Broomell than to sustain the old idea of the blood supply, because if the supply comes through the fibers of the pericemental membrane, supplying the pulp as well as the membrane itself, by cutting off the fibers and tearing them loose from their attachment in the alveolus, we will cut off, or interfere with, the blood supply to the pulp, and the probable consequence would be congestion and death of the pulp of the tooth. That should be a warning to the orthodontist to use particular care in the rotation of the teeth, and in the case of those teeth in which the pulps have died from rotation it would seem to be more through the tearing away of the attachment of the fibers of the pericemental membrane than from the rupture of any distinct vessel that might pass through the apex of the root, because in torsion we would not get the strain on such a distinct vessel that we would get from the forcible elongation of a tooth. So it will teach us to be particularly careful not to rotate teeth too rapidly.

So far as the extent of tooth movement is concerned, it seems as though it would be of distinct advantage to us; we can move a tooth to almost any extent without especial danger to its pulp. I have a case in mind where the lateral incisors were lingually placed, and were carried forward to fully the distance of one-half inch. The pulp was not apparently injured in the movement of those teeth, so I merely speak of it to show to what an extent teeth may be safely carried. You have all



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had this experience yourselves. Another thought is, that if a great portion of the blood supply of the teeth comes through the gum tissue, what effect will a long continued congested condition of the gums, through irritation of ligatures and appliances, have on the tooth tissues themselves? Now I want to indorse what Dr. Ottolengui has said regarding Dr. Broomell's second presentation. I think we owe him a great debt of gratitude for coming here, and for having done this work for us. I hope that next year he will be placed on the programme, and that he will in the meantime continue his studies along this line and see what he can determine regarding the blood supply of teeth where there has been full development, and the roots have been fully matured, as I understand he has not carried his investigations that far as yet. In this connection we would also like to have him continue his studies with regard to the pericemental membrane, and bring that also to us later on. I think these are very valuable studies, and coming from a man of the ability of Dr. Broomell we can consider ourselves very fortunate, indeed, to have the advantages of this great work, and I am sure we are all very thankful to him for it.

Mr. President: This paper of Dr. Broomell's

**Dr. Henry Baker,** is worth to me the whole trip to Detroit.

**Boston.**

If any one had told me before this that in the formation of the teeth there was no artery direct to each tooth pulp, I should have been very skeptical; after seeing Dr. Broomell's lantern slides, and listening to his paper, I do not see how it is possible for any one not to be convinced. His paper has made the subject very clear and simple. In following this paper there is between the lines something that makes one think; namely, the amount of study and work involved in getting these specimens to enable him to get such clear and perfect lantern slides and impress so forcibly upon our minds that there is not a question of doubt as to the correctness of his theory. To me it has been extremely interesting and instructive.

I want to express my deep appreciation to Dr.

**Dr. William Watson,** Broomell for his real contribution to science, and to repeat what Dr. Ottolengui said to me a moment ago in speaking of the beautiful illustrations:

"They beat argument all to pieces." I also move, Mr. President, that the American Society of Orthodontists request Dr. Broomell to carry this investigation on in relation to the fully calcified teeth, and that the expense of such an investigation be borne by this society.

**Dr. Gasto.** I have appreciated Dr. Broomell's paper very much. The question of the blood supply to the teeth, as presented by him, has been a revelation

to me. I have always been under the impression that there was a direct connection between the main blood vessels and the pulps of the teeth. I call to mind Dr. Cryer's illustrations in which he shows small bony tubes extending from the inferior dental canal toward the apices of the teeth, which he supposed carry the blood vessels and nerves to supply the pulp and peridental membrane.

In discussing the elongation of the mandible, Dr. Cryer claims that the inferior dental tube is stretched and that the small tubes connecting the main canal with the apical spaces are carried forward, which accounts for their posterior inclination, and which he claims furnishes evidence of an interstitial growth of the mandible.

I do not quite understand whether Dr. Broomell's conclusions were based only upon the early formation of the teeth. I would like to ask him at what time, if ever, the direct relation between the main artery in the inferior dental canal and the tissue at the apical space is established?

As to Dr. Casto's question I am not able to answer it. There is where I have stopped. He speaks of the work of Cryer. I do not think his dissections

**Dr. T. Norman Broomell.** absolutely show tubes running directly, or even in a twisting fashion, from the main artery to the root apices. If you will examine those specimens carefully, you will find the tubes are nothing more nor less than the cribiform arrangement of the bone, and they do not run directly to the individual roots of the teeth. No one has yet succeeded in pointing out positively that arterial twigs do pass from the main artery to the roots of the teeth. Therefore, I cannot answer the question as to the time when such a condition takes place, if it does take place at all. At the present time I am very much of the opinion, although I am not ready to make the statement, that there is no direct blood supply from the main artery to the root apices. I believe the blood supply is one which is established after the complete formation of the alveolar-dental membrane by a series of anastomosing vessels around the apical space, these vessels coming via the alveolar walls as well as from the gingival tissue.

You are in Philadelphia, Dr. Broomell, where **Dr. T. Lowe Young.** Dr. Garretson used to remove the inferior dental nerve and blood vessels. Have you ever seen in any one of those patients in what condition the teeth were in?

**Dr. Broomell.** I have not.

**Dr. Ottolengui.** In answer to that I may remind you of the many cases of fractured jaws where there is a complete fracture and consequently a complete separa-



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tion of all the vessels, including the canal. It is not conceivable that the artery reunites.

**Dr. Barnes.**

Do I understand you correctly, that there is never an apical arterial supply?

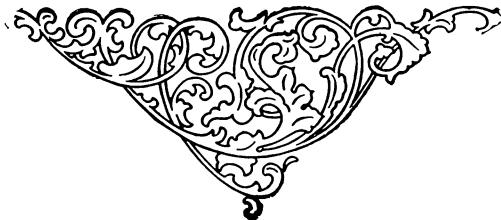
**Dr. Broomell.**

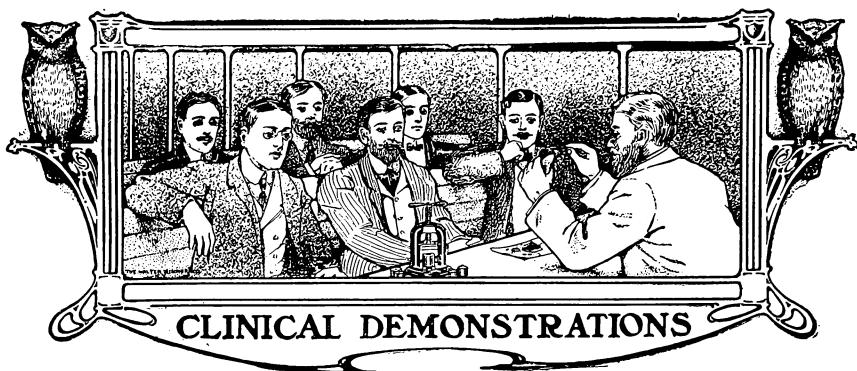
I am not ready to make such a statement at this time. I thank you very much for your attention, and am only sorry I must leave at this time.

**Dr. Kemple.**

I move that a very hearty vote of thanks be extended to Dr. Broomell for his splendid paper.

Resolution adopted by rising vote. Dr. Broomell was then unanimously elected an honorary member of the society.





## Technique of Making Inlays, and of Investing and Casting with the Taggart Casting Machine.

By WM. H. TAGGART, D.D.S., Chicago, Ill.

*Clinic before the Second District Dental Society, January, 1908.*

In all my casting work, whether operative or prosthetic, I am using a special wax, which will be known as "Taggart's Green Wax." This wax has been made green in color, because it will thus be easy to differentiate between the wax, the enamel, and the gum tissue when working directly in the cavity; and while most excellent results may be obtained by taking impressions and making amalgam or cement replica models of cavities, manifestly no duplicate of the cavity, and no articulated model thereof, can be so accurate as the cavity itself and the patient's own jaws, which must give the exact occlusion. A little practice will convince the majority of the correctness of my assertion that it is better to work within the mouth when making inlays.

**Method of Making Wax Inlay.** This wax is warmed in water not above 138 degrees Fahrenheit until it is thoroughly softened throughout the mass. It must not be warmed with dry heat, nor manipulated with the fingers, with the idea that the softening can be hastened in that way.

A piece the size of the stick and of length in proportion to the size of the cavity should be softened and carried in its original form to the cavity, and with the fingers firmly pressed into the cavity, allowing the excess to act as a piston in forcing it into all parts of the cavity. Next have the patient close the jaw, biting firmly into the wax, giving the imprint of

the opposing cusps. Then have him move the jaws, as in the act of chewing gum; this wears down all the high points and gives the correct occlusal form. All excess wax is then trimmed away, and the wax carved into the exact form desired for the completed inlay. A special quality of the wax is that it can be beautifully carved, remaining hard enough for this purpose even at the temperature of the mouth; and as

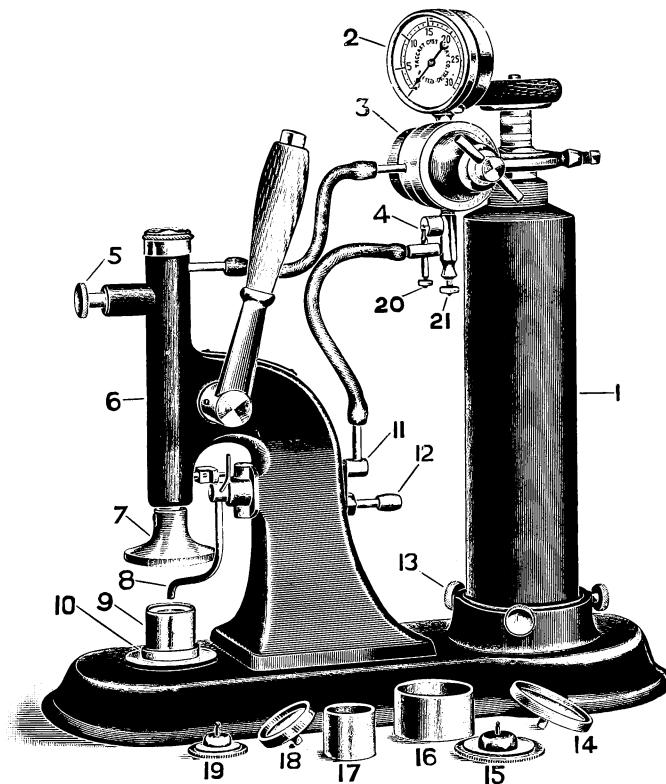


FIG. I.

the process exactly reproduces every form and line of the wax model, and as wax is more easily carved than gold, it will repay the operator to spend a little time, care and artistic skill in making the wax model. The wax inlay remains hard enough in the mouth so that it may be lifted from the cavity without change of form, and it can then either be held in the fingers for further carving, or artistic touches may be added when the wax inlay is mounted on the sprue, as in Fig. 2.

When finished the wax inlay is held in the left hand and the sprue wire in the right. Then heating the sprue wire until it will melt its way into the wax, the two are brought together, as shown in Fig. 3.

The inlay and sprue wire are then placed in the crucible former, as in Fig. 2. The investment is properly mixed in the following manner:

**Investing.** The large cup on the measuring device, Fig. 4, is to be filled lightly with investment and scraped off flush with a straight-edged, silver-plated dinner knife, which can be used as a spatula.

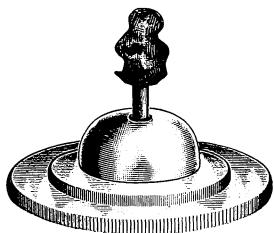


FIG. 2.

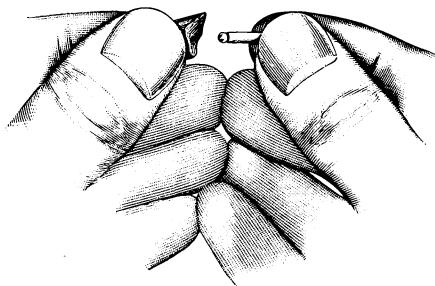


FIG. 3.

The small end of the measuring device, Fig. 4, is to be filled even full with water and the two mixed together. For the large flasks just double these quantities. Then place the rubber plaster bowl in the position shown in Fig. 5, and jar it on the bench, rotating it slowly in order to smear the whole inside of the bowl with a thin layer of investment. This allows all air to easily work out through this thin layer. Then carefully place the investment on the inlay in such a way as to absolutely avoid all air bubbles being caught in the investment, because these air spaces would be filled with gold in the casting.

This stage is represented by Fig. 6. Now carefully add to this, from the same mix, enough to pile it up, as in Fig. 7; then place the flask ring, round edge down, over this mass, as in Fig. 8. Do not jar the investment to make it go to place, as that only makes the contained air in the investment form large bubbles against the wax. Slightly rotate the flask and cover and the mass will settle; then, if necessary, add more investment and turn the flask over onto some smooth surface and press the excess to place, allowing the excess to squeeze out of the small hole in the flask. The investment should be allowed to set for at least fifteen minutes, or

it can be set aside for an indefinite period; but better results are obtained by drying out as soon as the plaster has set. When ready for casting, the crucible former is removed, as in Fig. 9, the flask is set over the bunsen flame and at first slowly dried out; as soon as the steam ceases forming a higher heat can be turned on and the wax burned thoroughly.

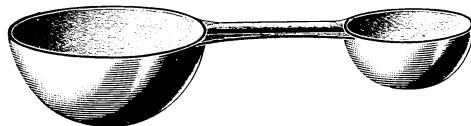


FIG. 4.

It is now ready for the casting machine, and a **Casting.** generous button of 24 k. gold, at least five penny-weights, should be placed in the crucible. As there is no waste in casting, it is always best to have plenty of gold in the crucible.

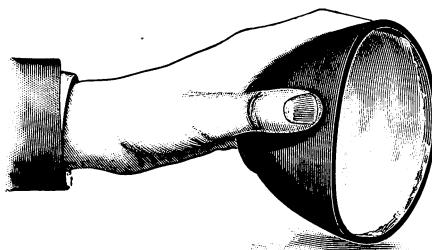


FIG. 5.

Referring to Fig. 1, the machine is operated in the following manner:

The flask 9 is placed in ring 10. The city gas is connected by hose to 12. The nitrous oxid blowpipe 8 is turned at right angles to the machine and the city gas lighted, making a smoky flame about four inches long. The handle to the reducing valve 3 is turned backward, or to the left; now open, with the wheel, the main nitrous oxid cylinder valve 1. This allows the high pressure of the nitrous oxid gas, which in a full cylinder is one thousand pounds, to pass into the reducing valve 3, and by turning the bar handle of the reducing valve 3 to the right, any de-

gree of pressure can be indicated on the gauge, although five to eight pounds is sufficient. The needle valve 21 is opened to allow nitrous oxid to flow through 11 to unite with the city gas, which comes in at 12. By mixing the proper proportion of nitrous oxid with the city gas you make a blue flame about three-quarters of an inch long. Now place the flask 9 in the machine ring 10, using the tongs; then turn the blowpipe to the proper position to play on the button of gold, and when the gold is in a boiling state, bring the handle forward with a decided jerk,

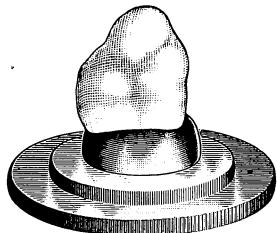


FIG. 6.

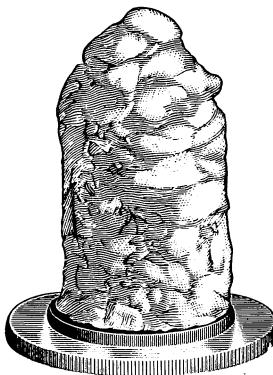


FIG. 7.

which will automatically throw the blowpipe 8 out of the way, and automatically bring the pressure plate 7 down airtight on the flask 9, and automatically hold the lever down by closing the lock 5, and automatically start the alarm whistle 4, which is regulated as to its volume of sound by the small needle valve 20. The object of this alarm is to draw attention to the fact that the main valve on the nitrous oxid cylinder 1 is to be shut off when the casting is finished, or the nitrous oxid will escape over night. The sustained pressure should be kept on top of the gold for thirty seconds, after which the flask can be taken out, and put into water, when the investment can be washed off. The inlay should now be placed in 50 per cent. hot hydrochloric or full strength hydrofluoric acid to be sure all foreign investment is dissolved off.

The excess gold is sawed off at the sprue and  
**Finishing.** the filling mostly finished out of the mouth. It is

always best to examine the cavity side of the inlay under a magnifying glass so as to see any little beads of gold which would prevent it going thoroughly to its seat. As these fillings fit the cavity

so tightly it is best to drive them to place several times with a stick and mallet before setting, and when the cement is in place, seat again with mallet and stick.

This repeated tapping with the mallet in different directions will seat an inlay better than it can possibly be done by direct pressure on the inlay. The margins can now be gone over with stones and disks of polishing tapes and finally polished.

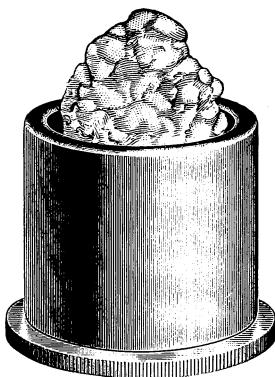


FIG. 8.

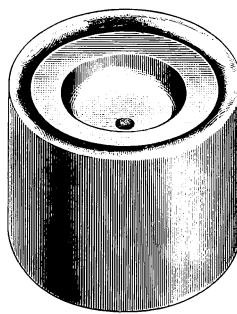


FIG. 9.

When prosthetic pieces are being made, Taggart's green wax should be kept at a workable temperature by frequently holding the model and wax in water at 138 degrees.

The possibilities for displaying ingenuity in constructing different prosthetic pieces are only limited by the versatility of the dentist.

The nitrous oxid blowpipe for this work has decided advantages over any other blowpipe flame, for the reason that the gold can be melted so much more readily, and brought into a more fluid condition and shot into the mold while the mold is practically cold, and not unduly expanded as the investment would be if the gold were melted by the ordinary blowpipe.

If at any time there should be a leakage of gas at the end of the flask 9, this can be stopped by bringing the plunger 7 down on an empty flask 9 and hitting the lever two or three sharp blows with the fist. This will drive the edge of the flask deeper into the packing which is on the underside of No. 7.

If the blowpipe flame should be irregular in its action, this comes

## ITEMS OF INTEREST

from an old gas meter, and can only be remedied by a new meter, which gas companies are always willing to put in free of charge.

**Special Points.** 1. Be sure the leather washer is on the yoke before attaching to the gas cylinder.

2. Be sure you put the yoke on the right way.

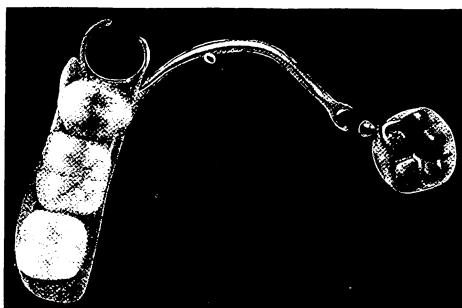


FIG. 10.

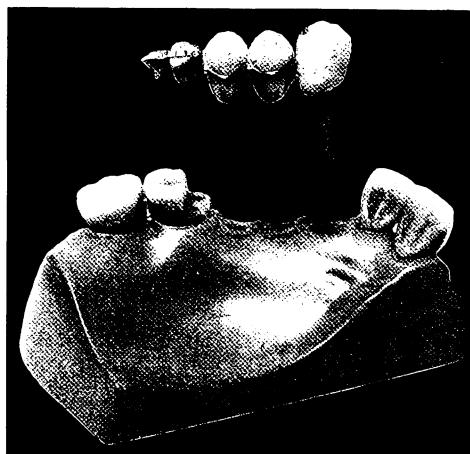


FIG. 11.

3. Light the city gas when the blowpipe is at right angles to the machine, and have a loose, smoky flame about four inches long.

4. Turn on the nitrous oxid at the main valve on cylinder.

5. Turn the lever on the reducing valve 3 until it registers the pressure required, from five to eight pounds.

6. Open the needle valve 21 to allow enough nitrous oxid to unite with the city gas to cause complete combustion.
7. Turn the blowpipe onto the clean gold in the crucible.
8. When the gold is bubbling, bring the lever down hard until it locks with 5.

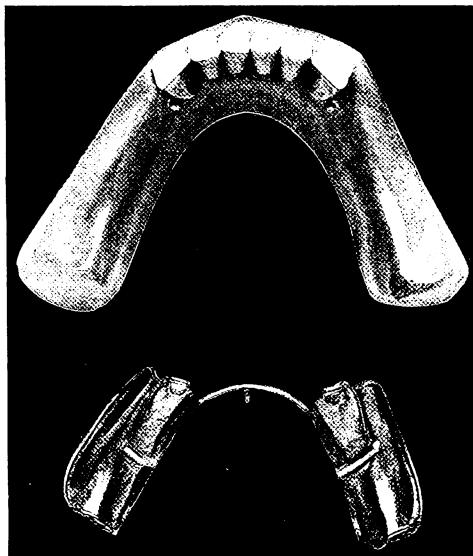


FIG. 12.

9. This should start the alarm whistle, which is regulated by turning 20 to the proper position.

Don't use anything but pure gold for your in-

**Don't's.** lays, and be sure it is free from borax and dross.

If you want a stronger gold for bridge attachment, use gold alloyed with platinum.

Don't use scrap gold and expect good castings, for it is impossible.

Don't use the crucible in the flask to melt the gold in to form a button. Do this on a piece of charcoal.

Don't overheat your investment, as all the heat required is enough to burn out the wax. Plaster disintegrates at three hundred degrees.

Don't fail to use the magnifying glass on the cavity side of the inlay.

Don't fail to remove every trace of investment from the filling.

Don't knock the wax inlay off the sprue wire while investing.



## ITEMS OF INTEREST

Don't fail to seat and reseat the gold inlay several times before cementing.

Don't fail to have your alarm whistle working, as this will save many cylinders of gas.

Don't fail to bring the lever down with considerable force, as this positively seals the flask airtight.

Don't use too much city gas in your blowpipe, as this is a chemical and not a blast flame.



FIG. 13.

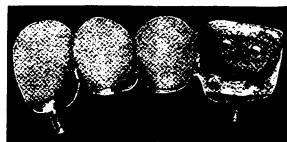


FIG. 14.

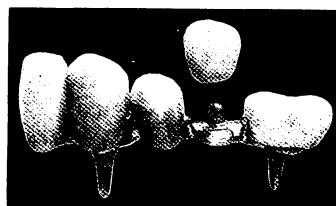


FIG. 15.

Don't expect to mold with an empty cylinder.

Don't expect to mold unless you turn the gas on at the main valve.

Don't fail to turn the nitrous oxid gas off when through casting.

Don't fail to charge more for these fillings, for they are worth more, and if you do not ask it you will not get it.

Don't think the machine is wrong and you are right, if you do not at first succeed, for it may be just the reverse of this.

Don't try to alter the machine or technique until you have mastered them. Then if you can improve them let the world know it.

Don't fail to do the best you know how every time.



### Descriptions of Cases Exhibited.

Fig. 10. Here is a cast I am very proud of. It is one of those unusually hard cases, where all the molars and bicuspids on one side are gone, and the teeth on the other side are there. This was made by Dr. Goslee. Very few of these specimens are my own. I purposely did that, to show you it was not what my friends have called "the wizard act." I said to a few of my friends who knew how to do it, "I wish you would make me up a case so I can take it to New York." Yesterday Dr. Goslee handed me this as his specimen. It is all cast, except the wire. An all-gold crown carries the Roach attachment ball. It is stuck into the wax, and the wax molded around it, after which the crown is cast. You will

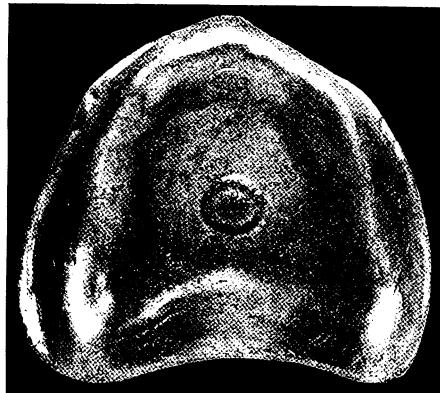


FIG. 16.

see the beauties of this process in not only making the plate itself, but also in the making of gold crowns, and also in the application of that kind of attachment.

Fig. 11. I feel very proud of this. Here is one made by one of Chicago's best dentists. See the tremendous amount of work it means to start in and make this from start to finish. These molars imbedded in the pink rubber base were continuous gum teeth. He built up the lingual surfaces with porcelain to make them fully contoured, and then cut the cavity in. Remembering that this cavity is cut in porcelain, and the holes drilled in porcelain, you can see the amount of labor. This is all cast, the inlay abutment, and the whole metal frame of the bridge; the teeth cemented on.

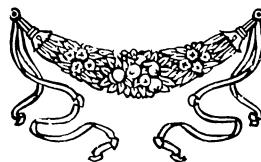
Fig. 12. Here is one made by Dr. Roach, of Chicago. It shows the Roach attachment. Those on the cusplids are Carmichael attachments. The ball is stuck into the wax, and the whole is cast. Those are then cemented on, and the balance he made by a swedging process. He had not gotten to the stage of casting for the prosthetic end of dentistry. He only saw this end of it. To-day he is making the same kind of cases by the casting process.

Fig. 13. Here is an illustration of what can be done in the way of casting against porcelain. Here are four teeth placed together to form a bridge. There are no checks, and I think you will see I have carelessly allowed the gold to lap in between the teeth where bubbles would form, and yet there is no checking, showing that by getting the flask sufficiently hot you can cast against porcelain.

Fig. 14. Here is a bridge with so-called Richmond crowns for abutments. These were all molded in wax, and cast as one piece. The teeth are cemented on. The holes in the gold are protected by putting little leads in the wax. Then carefully remove these; you can tease them off the wax. Then the lead pencil leads are slipped into those holes, and the investment put on. This was all cast at one time, and no solder put on.

Fig. 15. This is a five-tooth bridge made of Davis crowns. The base, or framework, is molded in Taggart wax, and the crowns set as desired. They are then lifted off, and the wax reproduced in clasp gold, and the crowns then attached with cement.

Fig. 16. This is a plate for a full upper denture, cast with a single sprue. The illustration shows the rough casting without any finishing. The spot in the center shows where the sprue was placed, a little excess of wax having been flowed around it to better secure it in the thin wax model of the plate.



## ITEMS OF INTEREST

*OFFICES IN MAISON BLANCHE*

DR. C. EDMUND KELLS, JR.  
1892

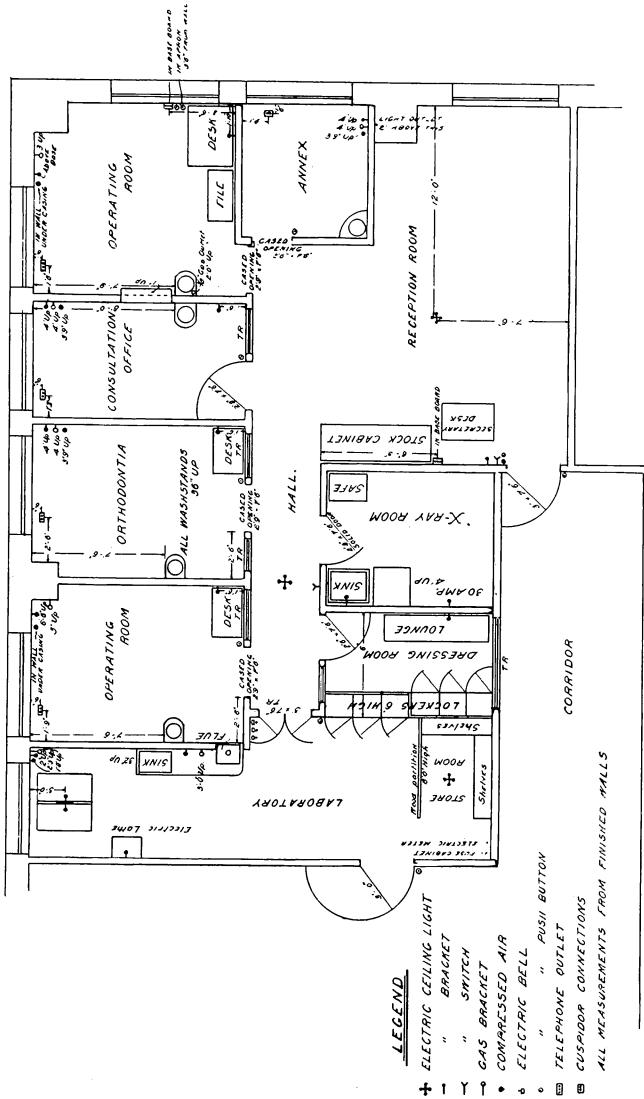
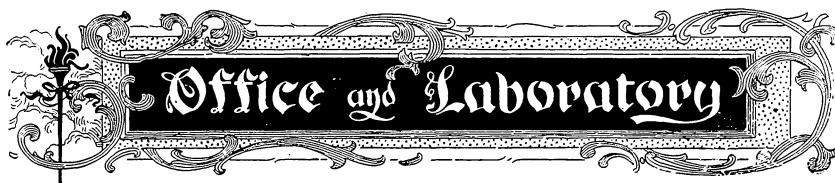


FIG. I.



# Office and Laboratory

## Modern Office Equipment.

By C. EDMUND KELLS, JR., D.D.S., New Orleans.

Nearly fifteen years ago *ITEMS OF INTEREST* published a series of illustrations of dental offices, amongst which was that of the writer, and from the many letters received regarding the same, it was very evident that the subject was at that time one of general interest.

During the past fifteen years, however, many changes have occurred—modern buildings have been erected in the larger cities which present unsurpassed facilities for the equipment of up-to-date dental offices, and modern time saving necessities require radical changes from ancient systems—or rather lack of system.

It has been the good fortune of the writer to be able to again avail himself of the improvements in office buildings, and once more to have been able to contract for the necessary space before the building was erected, and thus to have his suite of offices laid off, built and equipped exactly to meet the requirements of his practice.

From the floor plans shown herewith (Fig. 1) it will be seen that all working rooms are outside, and provided with exceedingly generous sized windows which afford a superabundance of light and air.

Incidentally it might be mentioned that from the window of the reception room, can be seen a perfectly grand view of the Mississippi River, and to see one of our modern ocean steamers come around the bend in the distance is a most interesting sight.

From the windows of the operating rooms can be seen Lake Pontchartrain in the distance, usually studded with tiny white sails of the sloops and luggers which ply its waters.

The plan of the offices is readily understood. Five operating rooms allow three live men to accomplish the greatest amount of work possible within the working day and prevent patients being kept waiting unnecessarily for consultations, examinations or applications.

One of the operating rooms in addition to the dental cabinet is provided with a cabinet completely equipped for doing crown and bridge work (gold and porcelain), thus saving my associate, Dr. McAfee, much time and many steps between his office and the laboratory.

A second is equipped especially for the practice of orthodontia, and Dr. J. A. Gorman, a specialist in that line, has charge of that branch of my practice, and devotes his entire time to it.

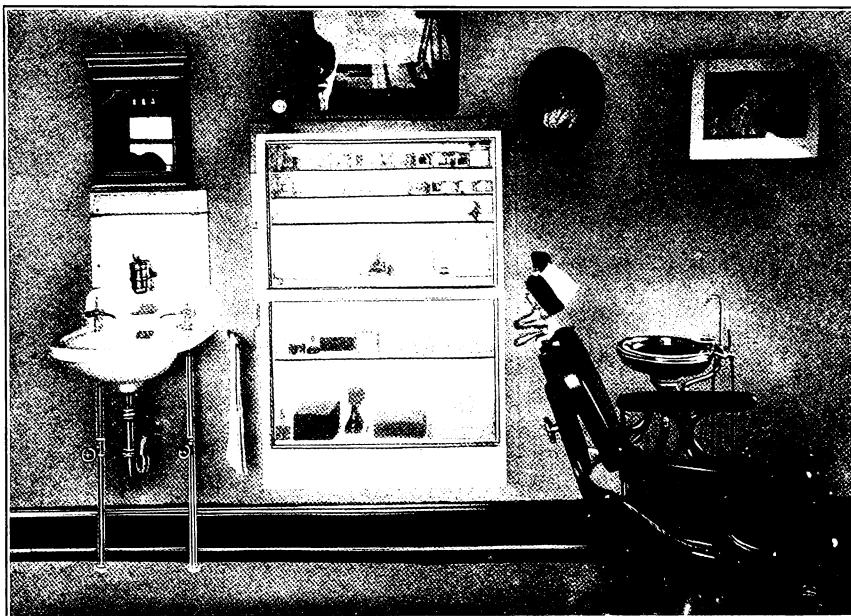


FIG. 2.  
Operating Room.

A third is used, generally, for consultations, examinations, extractions and the administration of nitrous-oxid, and is the only operating room that is provided with a door, all the others being furnished with portieres only. Curtains, while they afford all the privacy necessary, do away with that feeling of extreme seclusion which closed doors must naturally incite in ladies.

The corner operating room is the writer's and fully meets his own individual requirements. Each and every instrument and appliance has its own special place, and must always be found there.

## ITEMS OF INTEREST

The photograph (Fig. 2) shows the saliva tube hanging upon the sterilized spool on the cuspidor—put there for the benefit of this picture only, as it is never placed in position until after the patient has taken the chair.

The sprays and air syringe are suspended upon a bracket arm, thus making them accessible when needed, while they can be swung out of the way at other times.

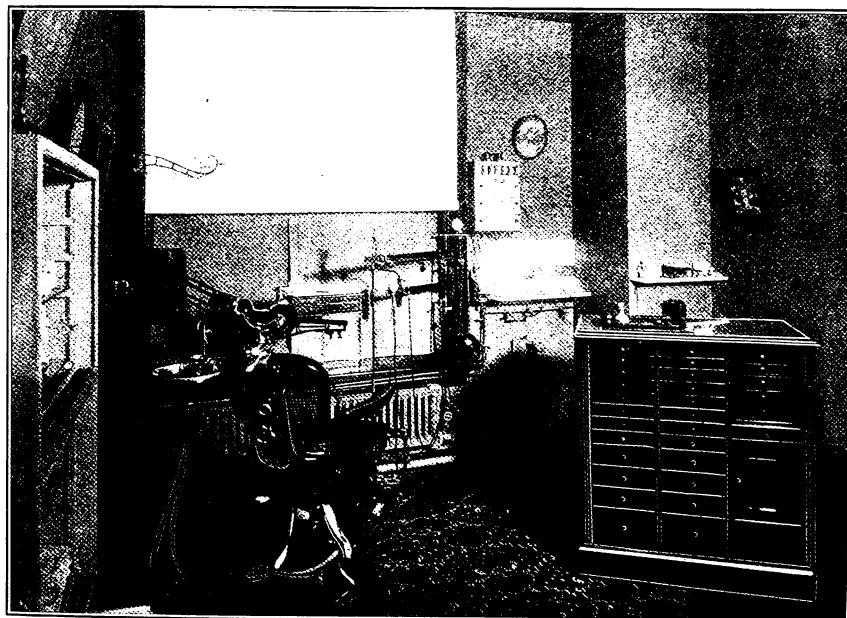


FIG. 3.  
Dr. Kells's Operating Room.

Over the washstand is shown the "Hygienic" soap granulator—a vast improvement over a wet cake of soap, and the very best soap proposition I have ever seen.

In the white enameled cabinet built in the wall to save space (from which the sliding doors were removed for this picture) are kept napkins, towels, *sleevres*, etc., and in little glass jars, prepared spunk, cotton balls, etc.

Beside the desk is a vertical filing cabinet. Herein are methodically kept the correspondence, bills, returned checks, etc.

The fifth operating room is the writer's "annex," and is used by him as a time saver.

The review of the reception room shows its "business end." By the side of the door is placed the secretary's desk (machine closed down).

The cabinet, with two of its doors wide open for the occasion, shows our method of keeping our stock. Upon the inside of the door on



FIG. 4.  
Showing the Vertical File.

the right hangs the list of all material which should be on hand. Amongst other things is a sewing basket containing the usual articles found therein, which occasionally is called for by some lady patient who has the misfortune to require it.

One inside room is utilized as a dressing-room in which each operator is provided with a locker, and a lounge is placed therein in case a patient should require it.

The other inside room, the X-ray room, is especially adapted to the use for which it was intended, and is entirely dark. This is equipped with a modern induction coil, running water and all accessories necessary for carrying on the work in all its details, from the taking of the skiagraph to the production of the finished print. The walls and ceilings are tinted red—the non-actinic color. The walls of all other rooms of the suite are finished in a restful green and the ceilings in a cream.

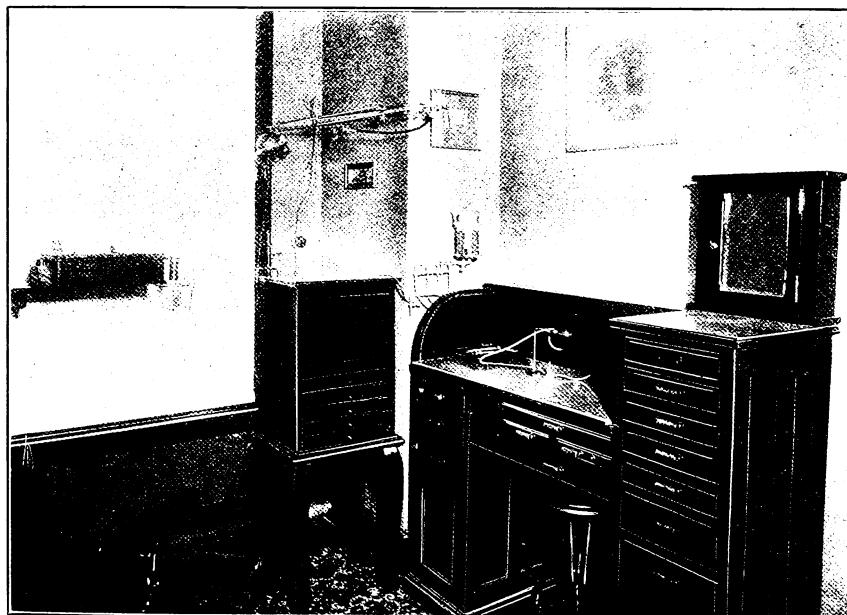


FIG. 5.  
Assistant's Office.

The laboratory is a large room well adapted to its uses, and provided with a door leading into a corridor. This gives the suite a "back door" for the porter's use, which is very advantageous.

A flue built in the wall carries the acid fumes out of the room and through the roof.

By the window are two work benches—one for each assistant—who can thus carry on or suspend his work without outside interference.

Here are lockers for the young lady assistants, and another for their dishes and provisions (for the office furnishes their lunch) and a refriger-

## ITEMS OF INTEREST

ator. Ample shelving allows of the keeping at hand and in plain sight the hundred and one objects of all kind that must always be at hand.

One end partly partitioned off allows of storing out of sight brooms, buckets, the porter's things, etc., and here the damp towels are hung for drying.

As tumblers are brought out from the offices they are put in the boiler. This consists of a copper pan placed near the sink. Boiling water

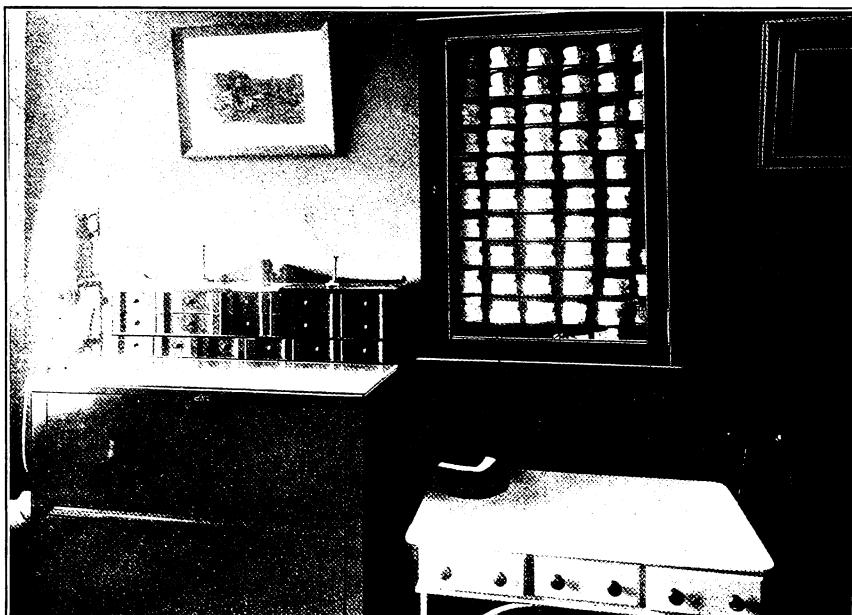


FIG. 6.  
Orthodontia Room.

is turned on and the pan gradually filled, when it is automatically emptied by a siphon. Then the tumblers are washed by hand with a well-soaped *double brush*, rinsed, dried and put in the little cabinet shown in one of the views.

In laying off the plans every water, gas, electric light or power, and compressed air outlet was plotted exactly where wanted.

While each operating room and the laboratory are naturally equipped with all time and labor saving devices that are upon the market, there are numerous devices to be found in this establishment that have been

originated by the writer and which, it is assumed, may be of interest to the reader.

For example, saliva tubes are of white glass only, and after being used, each is thoroughly rinsed and then placed in a jar of muriatic acid solution where it remains until the following morning. Then they are all rinsed, boiled and dried, and placed in a glass jar ready for use; *but* when taken up for use a sterilized tube is not connected to the tubing and then *hung upon the rim of the spittoon!* A clean glass spool which

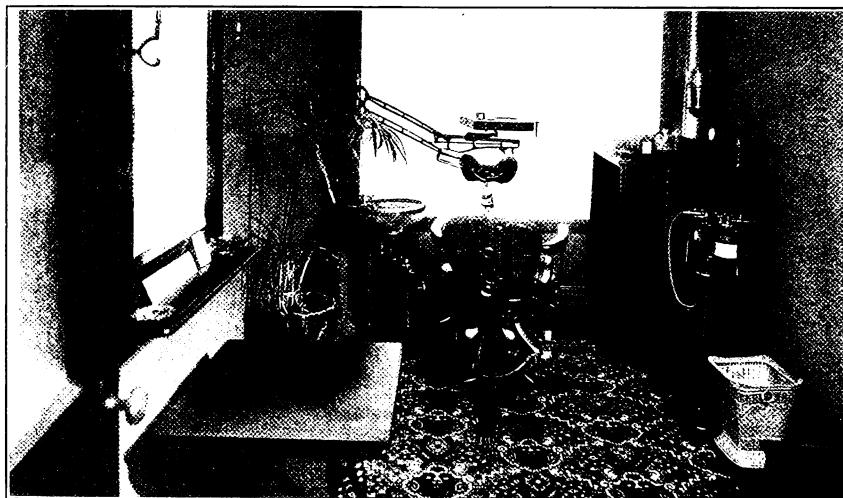


FIG. 7.  
Operating Room, Consultations, Extracting, etc.

has followed the treatment of the tube is first placed upon a support upon the spittoon and the tube is hung on this, thus avoiding the very inconsistent procedure first suggested.

Occasionally I used to be annoyed by having a patient place her handkerchief under the polished and nicely kept face guards of a rubber dam holder, and that set me to thinking. Strips of blotting paper are cut exactly  $3\frac{1}{2}$  inches wide and in lengths of 18 or 20 inches. These are then folded in two, lengthwise, and stitched so as to make it double thickness, and then cut into pieces  $2\frac{1}{2}$  inches long. A square hole is then cut in one side,  $1\frac{1}{8}$  by 1 inch, which is of a size to allow to be slipped over a Cogswell holder, and there you are—a clean face shield for every patient; inexpensive and quickly applied and removed.

How mortifying it used to be to have a lady patient open her handbag and take out a little comb and proceed to smooth up her hair? And then looking at my own comb and brush ready for her use, perhaps I could but commend her for her prudence! Now three dozen clean combs, each in its own sealed envelope, appropriately marked, *Sterilized Comb*, are distributed amongst the offices. This number is ample to allow of



FIG. 8.  
Stock Cabinet.

those which have been used to be immediately replaced by others, then sterilized at the attendant's leisure, and again sealed in new envelopes.

How often have we seen a lady use a little powder puff, taken from her "vanity case," or rag from her handbag, rather than use the powder and puff provided for the use of our patients.

Now we no longer have these powder boxes, but in their places the little paper books—"papier poudré" as they are termed, and I note their frequent use.

In the view of the consultation office are to be seen under the mirror one of these packets of powder leaves, the envelope containing the steri-

## ITEMS OF INTEREST

lized comb, and the pin trays—a like equipment being in each operating room.

How aggravating it used to be to come into the office with a clean white coat, work an hour or two and then have the inside of the left sleeve appear as if it had been worn a week. Now if that happens to a white coat in an hour, imagine the condition of a woolen coat sleeve which has been in use a month or more.

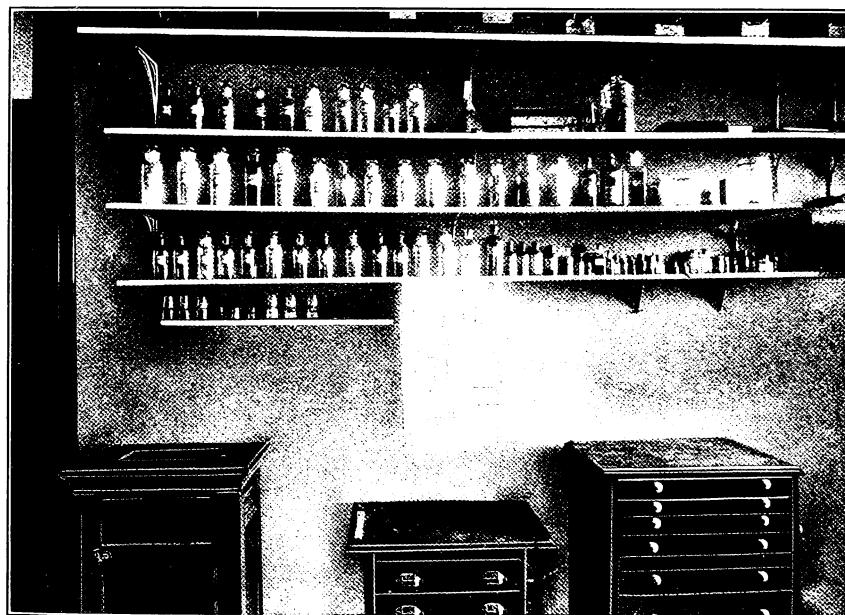


FIG. 9.  
One View of Laboratory.

Now short sleeves or long cuffs, whichever one chooses to call them, are made of "Berkeley cambric," and made by the dozen. One of these is slipped on the left forearm, fitting snuggly enough on the coat sleeve to be held in position and is changed as often during the day as *may be necessary*.

Of all the aggravating experiences we meet, I know of none more so than to turn to one's cabinet and fail to find certain material which was needed at the moment, because it had not been ordered in time.

This is now avoided, for upon the inside of the door of the cabinet



in which is kept our "stock" of material, hangs a list of everything required to run the offices—this list is added to as some new material is adopted, and carefully revised by each operator once or twice a year and discarded items erased. Every Monday morning it is the duty of the secretary to go over this list and check up the stock carefully, and any item which is running short is ordered. Thus a full line of everything used at the chair *must be* always on hand.

In the laboratory is another list, and this is likewise checked up weekly, so that at no time can any operator be delayed even for a moment for the lack of any material required.

In another cabinet is kept reserve stocks of napkins, towels, soaps, matches, stationery of all kinds, etc. In fact no article of use in the office is too insignificant to be overlooked, and must be on the spot when wanted. The only excuse acceptable for a shortage in any line would be that the "factory is closed."

The kinds of towels we use are classified by their color. A white crash is for the laboratory; a blue check is for use upon the spittoons only, and a red check is for the tumblers.

Once upon a time somebody decided that about 30 inches from the floor was the proper height to set a washstand, and for some unknown reason this became a standard measure, and every one has had to bend his back to this condition.

Now, we have decided differently. All of our washstands are placed 36 inches up, and we are greatly pleased with the change.

As for the business end of the line, the changes therein have been most radical during the past ten years.

The old flat filing system has given way to the vertical—great ledgers and record books have been replaced by modern loose leaf (*not card*) systems; voucher checks simplify accounts and economize both time and money; transo envelopes save an enormous amount of writing and avoid errors.

No detail in either the business or professional line is too small to be overlooked, or so indispensable as not to be dropped the instant it can be replaced by something better.

The planning of these offices, with everything laid off almost to the fraction of an inch, required much thought and study. Being for my own individual use, no outside assistance could be called in as no one else could know my requirements. However, the result has justified this outlay of time and labor.

Nearly thirty-five years ago I began the study of dentistry exactly across the street and not sixty feet away from my present operating room. Beneath me, upon the vacant lot which has become the site of this mag-

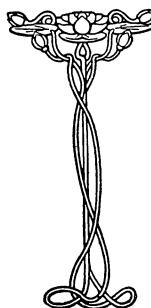


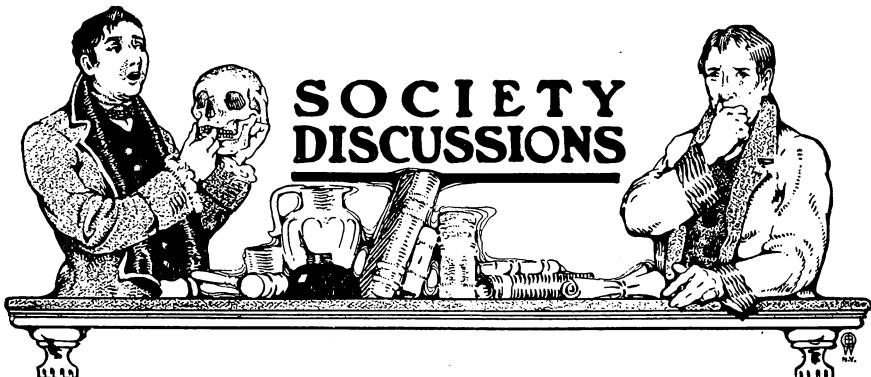
ITEMS OF INTEREST

nificent building, did I spend many happy hours of my boyhood days in childish play.

And here, while the scene of those days of irresponsibility has changed to one of strenuous activity, do I hope to pass my remaining days amongst pleasant surroundings; labors lightened by capable assistants and well-trained employees, the worries of "business" lessened by system in every line.

Nearly sixty years ago my father established this practice, and while success takes merciless toil from the life of the conscientious dentist, it is a pleasure indeed to be still serving the second and third generations of many, very many, of his early "patrons."





## SOCIETY DISCUSSIONS

### Second District Dental Society. January Meeting.

A regular meeting of the Second District Dental Society of the State of New York was held on Monday evening, January 13, 1908, at the "Assembly Rooms," Pierrepont and Fulton Streets, Brooklyn, N. Y.

The president, Dr. Hutchinson, occupied the chair and called the meeting to order.

In view of the important and interesting paper  
**Dr. Gould.** we have to-night, I move that we dispense with the usual order of business and proceed at once with the reading of the paper.

Motion carried.

**President Hutchinson.** We are very fortunate in having with us to-night a man who is world-renowned, and who is the father of what we may term an epoch in dentistry. He is also an honorary member of our society. You have seen him presented to-night with a diploma from the New York Odontological Society. Unfortunately the Second District Society has not at present any such diploma to present to Dr. Taggart and Dr. Goslee, but they were both made honorary members about a year ago. I take great pleasure in presenting to you the speaker of the evening, Dr. W. H. Taggart, of Chicago, who will read a paper, entitled, "Possibilities of Cast Metals in Prosthetic Dentistry."

Dr. Taggart read his paper.



## SOCIETY DISCUSSIONS

### Discussion of Dr. Taggart's Paper.

Dr. Hart J.

Goslee,

Chicago.

Mr. President and Members of the Second District Society: I am especially pleased to be with you to-night. This makes my fourth visit to you in three years—a pretty good record for one who comes a thousand miles. Also I am especially pleased to be honored with the distinction of opening the discussion on Dr. Taggart's two papers which he has given to the City of New York, as it was my fortune to open the discussion on his epoch-making paper last year.

A year ago I took occasion to say that I believed a new era in dentistry had dawned. We thought then—most of us—that the work would be applied more to operative procedures; but I prophesied also that the possibilities would be almost unlimited, and I call your attention to the fact that prophecy has come true to a large extent, as has been proven by the splendid specimens presented at the clinic to-day.

The usefulness of this method depends on the limitations of its application, and I think you will agree with me in that he has shown to us that its limitations are large; in other words, the field of application for this particular kind of work is almost unlimited, and I do not think we realize its possibilities at the present time. It was my good fortune to be among the first to grasp in a meager way the possibilities of this method, and I have been one of Dr. Taggart's most enthusiastic supporters throughout all the days he has been working on the process. I did not become his enthusiastic supporter from the view-point of friendship entirely, but largely I left aside the element of friendship, and became his supporter because I grasped the possibilities of the method he was developing at that time. Since the time he gave you his first paper, almost everyone in the West has observed the development of the method, and while some have been slow in grasping it, there are now very few in Chicago, at least, who are not employing it. It has revolutionized my own practice, because to-day I do not practice any phase of dentistry—crown, bridge or plate work—as I did a year ago, and I am sure that as each and every one of you becomes imbued with the full scope of the possibilities of the method, your practice will also become revolutionized.

I took occasion some two months ago to read a paper in Schenectady—and I also read the same paper in Toronto—in which I prophesied the future of casting metals in regard to prosthesis, and while I do not care to take up much time to-night enlarging on that prophecy, I do want to call your attention to why this has revolutionized my practice.

In the first place, I leave aside, for the present, its application to



operative dentistry *per se*, and will speak of it only in regard to prosthesis. The construction of my gold crowns, and I do make them—unlike Dr. Taggart—I say unlike Dr. Taggart, because I have heard him say on the floor of dental meetings that he has not made any during the last ten years. I have made them in that time, but in the last year I have changed my method. I make them by the casting method, and I get results which I could not get by the sectional or seamless method which we used formerly.

Passing from the gold crown to the porcelain crown—doubtless many of you know I have been a crank on the construction of porcelain crowns for many years. Perhaps less than a year ago I took occasion to mention that the ten or twelve anterior teeth in the mouths of a great proportion of my patients when crowned are crowned with porcelain crowns, not those we buy, but those we make. Notwithstanding I have been using that type of crown for a number of years, I have changed that within the last year, and am now using a ready-made porcelain crown, such as the Davis, Logan and White detachable crowns—using them in preference to the others, because we can obtain all the cosmetic effect we could obtain with the other porcelain crowns, combined with a greater degree of strength. Also in addition we have the possibility of replacement in the event of subsequent fracture. You can take any of those porcelain crowns, most of the forms of which are more or less beautiful in outline and color, and grind them to an approximate adaptation to the root, allowing some little space to exist between the crown and the end of the root, and then mold your wax to the outline of the basal end. Then lift it off and cast the base, and cement your porcelain crown to it, and the metal base to the root. You have a stronger crown, as good a cosmetic effect, and an opportunity for replacement.

All of my dummies in bridgework have been of porcelain in the replaceable form, such as the Davis crown. You can use ordinary diatotic teeth, if you can get a better mold. All have been backed up with cast backings. Take any gauge of gold you can swedge, or burnish, and adapt it as accurately as you can by either process, and reinforce it as much as you will with solder. Place it on the floor and stand on it, and you distort its shape, no matter how thick it is, unless it should be so thick we could not use it in the mouth; but if you cast the base you have a uniform degree of thickness and a stiffness which precludes any distortion of its shape, and a degree of strength which practically demands its use. If we had dummies for the six anterior teeth which could be used in the same manner, I should be using them instead of the others, because I am positive that a porcelain tooth cemented in this way is stronger than any other.



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This brings me to the thought that I have learned with some degree of surprise that most all the dentists in this part of the country are lamenting over the fact that they can not cast directly on to the porcelain—with any degree of certainty. Those with whom I have talked to-day want to do that very thing, in which I can see no possible advantage—casting or soldering to porcelain. Any time we can make a well adapted metal base, and attach our porcelain by means of cement, and we can use a piece of porcelain—a tooth or facing—which has not metal pins baked into it, we have a stronger result, and in the event of subsequent fracture by accident, we always have the possibility of replacement, which is one of the greatest advantages I can conceive.

In platemaking it has been my practice since I have been able to do so, during the last few months to cast every base I could get into the flasks of Dr. Taggart's machine, and he has told you why. You can make a good model, and make a wax base, and invest it, and make your casting, which will fit more accurately than you can by swedging, in less time than you could make your dies for a swedged base. Therefore, I call your attention again to the almost unlimited possibilities. Indeed, Dr. Taggart said the possibilities of this method were only limited by the skill of the man. I agree with him. If you will become proficient and endeavor to do this in the right manner, you will be surprised how almost unlimited will be its application.

He has told you that it is no careless man's process. I saw a dentist in Chicago not long ago prepare a cavity and make a wax filling in less than five minutes. The patient was out of the office in ten minutes. That man was careless, and if he was careless in making a simple filling, what would he do in the laboratory, working on a model? Let me repeat, it is not a careless man's method; but if we exercise every degree of care, just as we would in any line of work with which we hope to achieve success, we will be amazed at the degree of success we can get.

I will close by repeating what I have said so many times: We do not appreciate two things in this particular connection—first, we do not appreciate the possibilities of the method; and secondly, I fear in failing to appreciate the possibilities of the method we do not fully grasp and appreciate what Dr. Taggart has done for the dental profession.

**Dr. George Evans,** *New York.* I did not expect to be called upon. I have been suffering from a very severe illness, and a condition that has incapacitated me from speaking before dental societies in the manner I once did. Therefore I will be very brief. I highly appreciate what I have seen. As an experimenter, and in endeavoring to forward the interests of prosthetic



dentistry, no one can appreciate more than I what Dr. Taggart has done, and what labor he has gone through to accomplish it. I only hope that professionally, and also financially, he will be rewarded. Professionally he is, apparently, by the appreciation evidenced this evening, and the Odontological Society, of which I am a member, has complimented both him and Dr. Goslee. The possibilities of what he has presented to the profession are far reaching—far beyond our present conception. They are only introductory, and it is evident to me from what I have seen this evening, that they will be far greater than is now anticipated, especially in regard to the construction of bridges. It will be an advance from a cosmetic standpoint, from the fact that it will allow us to make a bridge that will be what you might term porcelain bridge work. Porcelain bridge work is the height of dental art; but it has heretofore failed in its practicability, and in the means of applying it.

It is for us to work out what Dr. Taggart has commenced, and help him in it as well as receive his instructions.

I thank you for having called on me, and thank Dr. Taggart and Dr. Goslee for what I have learned from them.

We have with us another gentleman who stands **President Hutchinson.** as an authority on prosthetic work, Dr. Bryant, of Washington, and I will now call upon him.

I came over to New York to attend a feast. I do not know after witnessing what I have in the last two or three days, and what I have seen of the work Dr. Taggart has shown, and what I have seen done by those who are using his method, but that I came to a funeral. I spent twenty or twenty-five years of my life in the hard and difficult work of prosthetic dentistry. It has not been an easy matter to follow out all the methods that have been evolved in that time, to take up from time to time the different little inventions, and to grasp the different conditions that are continually confronting us in prosthetic dentistry. It has been a hard and difficult work, and I say for that reason, after witnessing what I have witnessed, that I would almost say I have come to a funeral. If prosthetic dentistry can be practiced, and I have not the slightest doubt in the world but that it can, by the methods and means Dr. Taggart has given us, I must change my whole ideas of the practice of dentistry.

**Dr. E. S. Gaylord,** **New Haven.** Mr. President, Gentlemen of the Second District Society, Dr. Taggart and Guests: I do not possess the power of language sufficient to express my feelings in regard to this great discovery. If I had the tongue of Taggart, or Goslee, I certainly would attempt to do



## SOCIETY DISCUSSIONS

the matter justice, and before I sat down I would feel I had convinced every man who has not attempted to make cast-gold work before he left the room that he should begin to-morrow morning.

By courtesy of Dr. Taggart I have been using this method nearly a year—about eleven months—and while I can say nothing in addition to what has been said, I can simply assure you that a practice of more than thirty years has been absolutely reversed within those eleven months. What more can I say? Certainly this puts me on record as adopting the means entirely. I know of no means by which such perfect work can be done. You can see the specimens—it needs no testimonuy of mine to convince you of the great value of this method. I can only say that I would pay my highest respect, and almost homage, to the man to whom we are so deeply and so everlastingly indebted, for bringing this means to us; and not only the dental profession, but the whole world, is Dr. Taggart's debtor. I say that because I firmly believe that operations heretofore made with inferior materials will hereafter be made by this method, and millions of teeth will be saved where millions have been lost. We have a means within our grasp by which we can preserve those teeth.

I really feel I have no right to speak on this

**Dr. H. A. Compkins,** topic except just to express my admiration. Dr. Utica, N. Y. Taggart has been so loaded down with admiration that he will not be able to take it home, and I have not had the machine in my office a sufficient length of time to speak of it from the practical end.

One feature does impress me, and that is, the great relief that it is bound to be for every operator in preventing the long, tedious strain which has come to us all, week after week, and year after year, and put the gray hairs on our heads. Also the great relief that will come to our patients from the long sittings with the rubber dam and the mallet and the other infernal machines for the packing of gold. That will be gratefully appreciated by our patients, and they will be very glad that it has come to stay.

I believe it would be interesting to the gentle-

**Dr. Thadeus P. Hyatt,** men present, and particularly to Dr. Taggart, to Brooklyn. hear a few words from one who has never used the method—the impression it would give to a person who had the good fortune to be present this afternoon and listen to Dr. Taggart's remarks, and the suggestions made, and the results shown this evening.

In speaking of a new era I think it is a period we can look forward to with the greatest hope and gratification, because we will be able to demonstrate the beauties of our skill. For myself, in all the meetings I



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have attended, I have not yet seen any work that showed so much possibility of artistic skill and beauty as that shown here this evening. I realize that instead of a little puff of wind, as has been said this evening, it will require a great accuracy of the hand in the preparation of the cavity and in the carving of the wax, necessitating an artistic ability that will have a greater reward than any skill we had in the years gone by. And after all is said and done, no matter how carefully we may do our work, if we achieve the result I am sure we will feel gratified and well repaid for the labor. The demonstration this afternoon, the paper this evening, and the specimens shown, make me want to go to work with the confidence that what skill I possess would bring about more beautiful results than anything I have ever done before. I want to start right in and do some of that work for my own satisfaction, and, as has been said, for the benefit of the patients for whom I work.

I thank you heartily, and, although I have not yet done the work, I am looking forward to realizing a great deal of pleasure from the method.

I can not help expressing my gratification for  
**Dr. J. Grant Pease,** this innovation, and my thanks to Dr. Taggart for  
**New York.** the possibility of having this great labor-saving and humane method in dentistry.

I have been the possessor of a machine for a short time, but in that time I have done some of the work, and it has proved the principle. Especially do I feel grateful for saving my patients the long sittings and the suffering which were necessary in the past. There has been one operation which was a great satisfaction to me, and that was in replacing the buccal wall of a fractured molar by making a band to surround the parts, placing wax underneath the band, forcing it in position and getting an accurate impression, and then by supplementing that with a larger quantity of wax for the cusps, and uniting the two with a pin. I put this in the machine, and got an accurate adaptation and accurate result in the form of a crown with adapted gold to the fractured portion of the tooth. I am very thankful for those possibilities, and I know that in the future they will work more and more to my own comfort and to the benefit of my patients.

Speaking of revolutionizing one's practice  
**Dr. F. C. Van Woert,** brings to my mind the change that took place in my practice after having had a seance with Dr. Taggart  
**Brooklyn.** in his "kitchen," as he calls it, in Chicago. I felt so confident of what I learned there that I immediately put it into practice, and abandoned old methods without further ado. Some years ago, when Dr. Jenkins gave up the use of gold foil for porcelain exclusively,



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I thought it was a foolhardy thing to do. I admired his courage, but I did not believe it would be possible for anyone else to take so radical a stand. Immediately upon my return from Chicago I took the same position exactly that Dr. Jenkins did, except that I do not eliminate amalgam nor plastics. I do not believe it is possible for any gentleman in this room to continue in the old way and succeed in practice. This method has come to stay. We have been working in the dark for years. The introduction of Dr. Jenkins' porcelain which made that method practicable was the breaking of the dawn, the opening of the day; and as I stated at the Brooklyn society dinner last year, when Dr. Taggart came here, it was the bursting of the sun to full daylight, and God knows what we may expect when midday come!

But it will take a lot of time and experiment on the part of individuals to perfect themselves. It will require sad experiences to convince you that before you get through you must have accurate fillings, or they will not succeed. It has been spoken of here, and I have heard it and seen it, in fact in my own office it was demonstrated, that a piece of pine wood soaked with water would produce a cast filling; but will it do so regularly? It will not. It is not reliable, and if you pin your faith to a makeshift of that kind, you will fail, and then immediately you will condemn the Taggart methods. There are limitations to makeshifts, but I can hardly see any limitation to the Taggart machine. You will find after working with any method you select it is only a question of a little time when you realize that each individual case requires some attention. For instance, in a casting where there is a large quantity of gold, or covering a large area, the need of pressure I have found is less than where a small mass is used for a small filling. Hence, you must have something to tabulate it, to know what you are doing to get accurate results. Above all, you must have a perfect machine for your casting. It is an old saying that a mechanic can build a house with a hammer and a saw; but he can build a much better one with all the perfect tools that are now made. I do not flatter myself that I can whittle with a jackknife as good a model of a boat as I could with good tools; and I know it would take so long and be done with so much discom-fort that I would not want to make the second.

Many men are making the biggest mistake of their lives in that they curtail the equipment of their offices. There is no money so well spent as that invested in good instruments, and in apparatus of any kind to further your operation. It will bring you business and give you the chance of doing again as much, if not five times the amount in the same time, and besides, it is saving your vital energy.



Those of you who are near and dear to me know how I feel about it. I feel as though I could get up on the roof and shout, "Glory be to God," for what has come in the last two or three years for our benefit, to say nothing of the benefit to the public at large; and Dr. Taggart knows my appreciation of all his efforts. It would be foolish for me to try to say more than I have; but I want those of you who have not put your shoulder to the wheel to do so; and if those of you who are still wielding the mallet and pounding gold, will exert as much energy with the new method, you will ask yourselves why you have not done this before. Dr. Taggart wrote me before he came here last year that it was a mystery to him why he had not thought of it before, and why some one else had not thought of it; but he is the man who did think of it, and those of you who have profitted by it should shout as I say I would, "Glory to God for what he has given us."

I would like to say a word in praise of that  
**Dr. F. H. Nies,** mechanically perfect device—the Taggart inlay  
**Brooklyn.** machine. For the past four or five months I have

been using the so-called gravity method of casting—a device of my own construction. That is, I simply had a platinum band, put my ingot on top of this investment and stuck it in my press. I also have tried the other gravity machines. While I succeeded once in a while in getting fairly perfect castings, I found that those castings were not so dense as those cast under pressure. The United States Government in casting guns never casts by gravity. They use intense hydraulic pressure. I have found the Taggart machine condenses perfectly, and I have found the castings perfect. I did not find them so with the gravity machines; I think the principle is wrong. I think pressure is absolutely necessary, and it is necessary to enclose and force down the castings. Every brass and iron founder knows the base of his castings is much more dense than the top, and that is due no doubt to the mass of molten metal that forces it down and makes it less porous. I have found the use of flake graphite as an investing material, mixed in the proportion of one teaspoonful of the graphite lubricant to two parts of plaster of Paris, more perfect than Peck's compound. The castings come out perfect. Iron founders have coated the inside of their molds with graphite, and I thought a trial of it might result in something, and I earnestly commend the use of that investment to Dr. Taggart. I also found the use of smoked glasses helped my eyes very much in this work. I again thank the doctor for that machine.

**Dr. Ottolengui.** Mr. President: I have opened so many discussions, and precipitated myself into so many discussions, and I wanted so much to hear from other



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people that I determined I would not get up unless you made me do so. There are many men who have not spoken to-night who spoke very interestingly to-day at the clinic, and I hope those men will get on their feet when I sit down. I want to say a word about the title of the paper, "The Possibilities of Casting Metals in Prosthetic Dentistry." I am quite positive the majority of those who read that conceived the idea that it meant what used to be called "mechanical dentistry." I want to give you a peculiar thought: One of our honorary members, Dr. Goslee, last year read a paper before us in which he bewailed the fact that prosthetic dentistry, so-called, had retrograded. As a matter of fact, prosthetic dentistry as we see it to-night is driving so-called operative dentistry out of the field altogether. The filling of teeth became partially a prosthetic method when they were filled with porcelain. Now that the inlay proposition has been made possible in metals as well as in the ceramics, the entire art of filling teeth becomes prosthetic dentistry, because the operative method can be restricted to the preparation of cavities and the cementation of the inlays, and all the rest of the work can be done in the laboratory; and it is quite possible that in a short time the operating room will be 4 feet by 4 feet, and the laboratory will occupy the rest of the suite.

I am glad to say I was instrumental, as a member of the Executive Committee, in persuading Dr. Taggart to come here to-night; and I had a purpose in that which I think has not been guessed. The men in Brooklyn are not getting paid for their work. They tell me privately that the people in Brooklyn will not pay the fees that New York dentists receive. That is not true, because they come over to New York and pay them. It has been said that this method is destined to revolutionize our practice. I am going to suggest to you that you make the revolution complete, and let it also revolutionize your fee system, as it has revolutionized mine. For example, I find I can get, without any question, for a Taggart inlay, that it takes an hour to make, two and a half times as much as I could get for a gold filling that would take an hour to make, and I am not nearly so tired when the operation is completed. A woman will pay a great deal more money for a hat that is in style than for a better hat held over from last season.

Patients will all pay for perfect fillings, which perfectly preserve their teeth, and which can be made for them without pain, and with a minimum expense of time. They are very willing indeed to have their teeth filled in the laboratory, I assure you.

You can make this an opportunity to revolutionize your fee system. You can not very well raise your prices for old patients, especially if they understand your methods, without a reasonable excuse. Taggart brings



you a reasonable excuse. Say to them, "I am going to give you something better than you ever had before, but I am going to charge you in proportion." You can get better fees from your old patients, and you need never tell your new patients anything about your old fees.

I said to Dr. Taggart when he first showed me his method, "The one weakness of your method lies in its greatest strength. You will not only reproduce all the good models dentists will make, but also all the wretched models dentists will make, and when they are put into cavities, and do not fit, the machine will be damned, because every dentist thinks he is the best dentist in his town, or in his county."

Dr. Taggart did not bring you the first machine he invented, as many others are doing. He made one, and then he made a better one, and so on until all the separate drawers in his laboratory are filled with casting machines which he has never shown you, but which I and several others of his friends have seen. Last year he showed us a machine which all of us were ready to buy, but which he was not ready to sell; and while he was making a better one, others were being handed around. Finally, he came to Asbury Park with what he thought was his perfect machine, and he offered it to the profession, and the profession eagerly asked for the opportunity of getting it. Again there have been exasperating delays, and I want to tell you that the machine which he showed you to-day is nearly as much superior to the one he had in Asbury Park as that one was superior to the one he had here last year. There were certain things which were well enough in a hand-made machine which were not good enough in a machine-made machine, and in the manufactured product he made discoveries which were not known to him before; and if there have been delays it has been in your own interest. It would have been much more to Dr. Taggart's interest to give you a machine at once before the market was flooded, but he has waited to give you the best.

We should take just the same pains in our technique, so if failure comes we will know exactly why. If we have a failure, instead of rowing with the machine, let us study the machine, and let us help this grand and beautiful process which is only in its beginning, and contribute to the ultimate success of the Taggart casting process, for by that process I tell you we will be able to make easy work better, and we will be able to make better work easier.

I have been wondering regarding the matter of the educational side of it. There has been forced upon me during all this year the feeling of the great departure, as it were, from the old methods to the new. I was recently in New Orleans and saw those specimens Dr.

**Dr. Ellison Hillyer,  
Brooklyn.**

Brophy carried down there, and also went over carefully the different methods being pursued in various colleges for the bringing out of this particular technique. I cannot help, especially on occasions like this, thinking of that dear man who has gone—Dr. Littig—whom you all loved as I did, and revere as I do, and thinking of the night a year ago when he stood there discussing Dr. Taggart's paper, and of the afternoon we spent together at Dr. Taggart's office clinic. He said he was glad he had lived to see this great change, and I am only sorry he has not lived to carry out what he had already started to do, in just the few months that were allowed him after that meeting in January. It is not going to be an easy thing to jump into this new method as far as students are concerned, for, strange to say, we are expected to give the students about everything—dating back from Noah up to the present time—and in a paper read before the Pedagogue Society last week I was amazed in a mild sort of way to find how many subjects were put into a form of curriculum for dental prosthesis. There were several things there that are as obsolete as can be, and as we are looking forward to the coming curriculum, it is a question of exactly where we are going to be five years from now. It is a matter that is receiving a great deal of attention from the educational side, as well as the practical side.

It is unnecessary to add a single word in regard to Dr. Taggart. A good many of us have been waiting for those machines. We were promised the first, and they were all to be marked No. 1. I am still waiting for mine. That has not kept me from doing some of the work, however, as Dr. Taggart and others know; but I am still hoping I will get that No. 1 machine. I understand the first thousand are to be marked No. 1. (Laughter.)

The words of the last speaker may even be read between the lines, for it seems to me a man having devoted so much of his time to getting this into the form it should be gotten before it was brought out should receive all the credit that is possible and due to him. Dr. Taggart has given a number of things to the profession, and I doubt that he has received a cent for a lot of them. It seems outrageous that a few dollars will stand in the way of giving him the benefit, whether he needs it or not I do not know, of that which is really due to him.

The hour is late, and there is nothing of any  
**Dr. Taggart.** further interest that I can add to the meeting; but I thank you for the reception you have given me.

If there is any novice here, or any expert here, no one has enjoyed the discussion more than I have. It always makes me feel good to see how the other men view it through their eyes. The father of the child plays with it, and gets to love it, and its little peculiarities, even if it is an idiot;



and for fear that may be my condition, I have often thought, "Am I over-enthusiastic; am I not worshiping it because it is my child?" And when I come before you, and hear words from men I never saw before, praising the method and the system, and saying they have attained more beautiful results than they ever have had before, I feel I am abundantly repaid. There have been several attempts to refer to the commercial side; but the commercial end has never entered my head. It has been how much could I do for humanity and the dentists who are my brothers. I thank you all.

I move that we rise and pass a vote of thanks

**Dr. Ottolengui.** to Dr. Taggart, not only for the paper he has given to us, but on behalf of the Brooklyn dentists, and the dentists of Greater New York, for the fact that his two principal papers have been given to us.

Motion carried unanimously by a rising vote and much applause.

Adjournment.





It is several months since we presented the first plea by Dr. Leon Williams for an improvement in the forms of artificial teeth, and though we have received and published a number of letters advocating a change for the better, we have as yet found no one ready to undertake the task of telling exactly what is wanted.

What are the facts, when reduced to a simple statement? Has any one, with any full set of teeth supplied by any manufacturer in the whole world, without in any way grinding any surface of any of the teeth, been able to so arrange an artificial denture, that when placed in the mouth they would naturally perform the normal functions of mastication? Very probably not, and if not, then such teeth are not properly called "artificial teeth" at all; they might better be denominated "false teeth."

Conversely, supposing that full sets of human tooth crowns could be placed on sale in as great variety and numbers as are the false teeth at the dental depots, is it not likely that hundreds of prosthodontists could select a set for a case in hand and arrange them without the slightest alteration, so that normal occlusion would be perfectly restored?



The one possible doubt in regard to the last postulate arises from the fact that often, after the loss of the natural organs, there is a resorption of the process sufficient to render a truly normal rearrangement impossible. This is especially true where an upper substitute denture is to be supplied upon a shrunken natural arch, and yet must occlude with human teeth in the mandible, still practically in their normal positions. It is possible, therefore, that absolute copies of human teeth are not really desirable; yet assuredly we might approach Nature nearer than has yet been done, with advantage to all concerned. It has been pointed out that certain manufacturers have produced so-called "natural molds" only to find little, if any, demand for them, and this is used as an argument against the making of teeth which more nearly resemble real teeth. The argument is preposterous. The truth probably has been that one or two dealers have put forward one or two molds which have been actual copies of human teeth. These, among thousands of the old kind, undoubtedly appear as freaks, and at all events could only be used in isolated cases.

The problem will never be solved in any such manner, and in order to determine just how closely Nature must be copied, and just what departure from natural forms may be requisite to produce molds which will be practical in the hands of the majority of dentists, skilled and unskilled, there appears to be but one certain mode of procedure, unless, indeed, a genius shall arise for the occasion and show us a shorter road to success.

Some skilled prosthodontist should undertake the following series of experiments: First, he should procure accurate casts of an edentulous mouth. Next, with the best obtainable set of "false" teeth, he should arrange a perfect articulation in accordance with the rules set down by Bonwill. The result will be porcelain teeth with the occlusal, and in many instances the buccal, surfaces ground, so that, despite the fact that they articulate, they will have lost all resemblance to true tooth forms. Next he should set up before him an articulated human skull having teeth of similar size and type, and then, copying these natural organs, he should restore the true shapes of the artificial substitutes by the additions of porcelain properly carved and fused.

Thus could be produced a set of artificial teeth like in form to human teeth, and yet performing the normal functions when introduced



within the mouth. If this procedure were repeated with different types and temperaments of individuals a most valuable series of models for proper and practical tooth forms would be evolved. Then the manufacturer who would have the courage to offer the profession a large and complete assortment of such artificial teeth, at the same time completely retiring all his old forms, would reap the merited reward of a good work well done.

Success, however, cannot attend any sporadic attempt to introduce one or two forms as "novelties," the old style being still on sale. With the absolute retirement of all old stock, and the exclusive offering of the newest, best and most natural teeth ever offered, it would require no great time to demonstrate to the dentist the value of teeth which need little or no grinding, and with which their patients might eat with little or no complaint. Undoubtedly the demand for such teeth would quickly tax the capacity of any tooth factory, and compel all rivals to imitate the new molds.

But the manufacturers can not properly solve this problem without the aid of an artistic prosthodontist to furnish the models. Have we such a man in this country, and will he undertake this great work for the profession, and for humanity?

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### **Jubilee Meeting—Indiana State Dental Association.**

The great meeting held under the auspices of the Odontographic Society in Chicago, with its record attendance, made an epoch in dental history, but the Indiana State Dental Association has determined that its semi-centennial jubilee meeting shall so overshadow the Odontographic that the latter will become merely an incident of the past. The Indiana Association has invited the state societies of Ohio, Kentucky, Illinois and Michigan to be their guests, and Drs. M. H. Fletcher, H. B. Holmes, T. W. Brophy and Charles Zederbaum have been selected as essayists to represent their societies, while Dr. B. W. Black will be the guest of honor. The four states named will furnish fifty clinicians, in addition to which an invitation has been extended to every state dental



association in the country to regularly nominate and send at least one clinician as its representative. The meeting will occur at Indianapolis on June 4, 5 and 6. Dr. J. Q. Byram, the chairman of the Executive Committee, will give full information to all who contemplate attending. Dr. E. R. Kibler, of Indianapolis, will be glad to hear from clinicians. There is no doubt that this will be a rousing meeting and one that will long be remembered.

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### **Dentists to be Barred from Using X-Rays.**

A bill has been introduced into the Legislature of New York State which would be comic were it not serious. Congressman Mark Goldberg has introduced a bill amending existing laws regulating the practice of medicine as follows: "X-Ray Machines. No person other than a duly registered and legally authorized physician shall use what is known as the X-rays, or Roentgen rays, on any human being for any purpose whatever, and such use shall be deemed to be the practice of medicine within the meaning of this chapter." The Legislative Committee of the New York State Dental Society should take cognizance of the above immediately.



# IN MEMORIAM

## Dr. P. E. Loder.

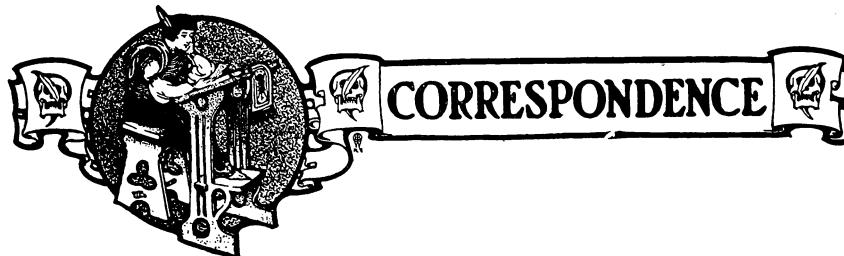
The South Jersey Dental Society hears with regret and sorrow of the death of one honored and esteemed, whom we had hoped to associate with us in our society as an honorary member, Prof. Percival E. Loder, whose name was proposed for such membership at our last meeting.

WHEREAS, It has pleased the Divine Creator to take from our midst Prof. Percival E. Loder, scholar and teacher, a man to whom the profession owes much gratitude and whose memory will long be cherished among us; therefore be it

*Resolved*, That by his death the South Jersey Dental Society has lost a most valuable member and adviser; the dental profession an esteemed teacher; a large clientele has lost a kind, efficient and faithful servant.

*Resolved*, That these resolutions be spread upon the minutes, a copy sent to the journals and a copy sent to his bereaved family with expressions of deep sympathy for them in their sorrow.

A. R. SLADE,  
A. B. DEWEES,  
A. K. WOOD,  
Committee.

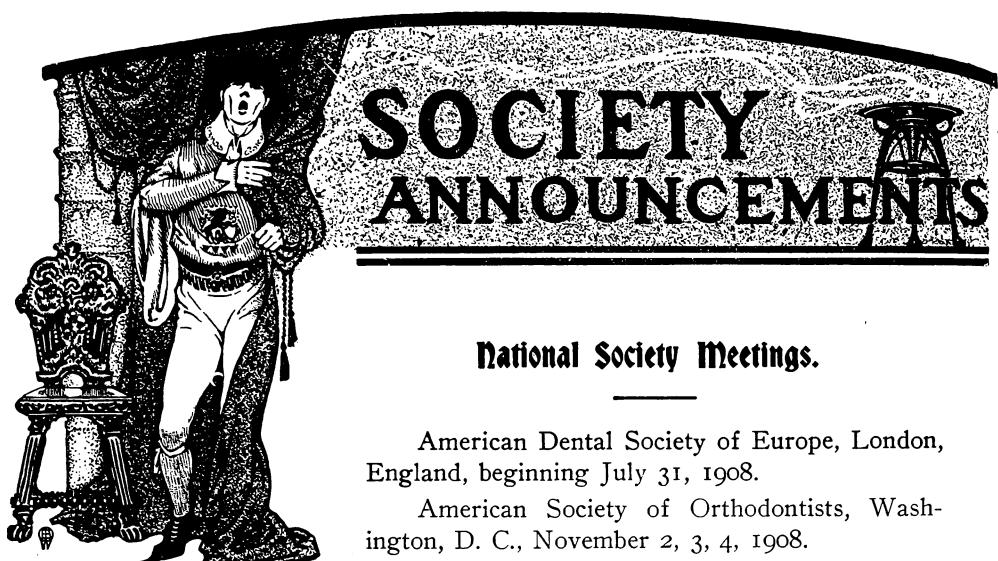


### Editor ITEMS OF INTEREST.

Dear Sir—The formula given in the November issue of ITEMS OF INTEREST in my paper on "Empiricism in the Practice of Dentistry," does not apply in any way to the Oxpara remedy made and sold by Dr. E. W. Dodez. The formula given was for a root-filling cement following the prescribed treatment.

Yours truly,

W. H. JONES, D.D.S.



# SOCIETY ANNOUNCEMENTS

## National Society Meetings.

American Dental Society of Europe, London, England, beginning July 31, 1908.

American Society of Orthodontists, Washington, D. C., November 2, 3, 4, 1908.

National Association of Dental Examiners and the National Association of Dental Faculties, Back Bay, Boston, Mass., July 24, 25, 27, 1908.

National Dental Association, Boston, Mass., July 28, 29, 30, 31, 1908.

Southern Branch of the National Dental Association, Birmingham, Ala., May 12, 1908.

## State Society Meetings.

Alabama State Dental Association, Birmingham, Ala., May 12, 1908.

Arkansas State Dental Association, Little Rock, Ark., May 26, 27, 1908.

California State Dental Association, San Francisco, Cal., June 9, 10, 11, 1908.

Colorado State Dental Association, Boulder, Colo., June 18, 19, 20, 1908.

Connecticut State Dental Association, Bridgeport, Conn., April 21, 22, 1908.

District of Columbia Dental Society, Baltimore, Md., June 4, 5, 6, 1908.



Florida State Dental Society, Tampa, Fla., May 21, 22, 23, 1908.

Illinois State Dental Society, Springfield, Ill., May 12, 13, 14, 15, 1908.

Indiana State Dental Association, Indianapolis, Ind., June 4, 5, 6, 1908.

Lake Erie Dental Association, Cambridge Springs, Pa., May 19, 20, 21, 1908.

Maryland State Dental Association, Baltimore, Md., June 4, 5, 6, 1908.

Michigan State Dental Society, aboard steamer "Mackinac" en route to the "Soo," Mackinac Island and return, June 10, 11, 12, 13, 1908.

Minnesota State Dental Association, St. Paul, Minn., June 8, 9, 10, 1908.

Nebraska State Dental Society, Omaha, Neb., May 19, 20, 21, 1908.

New Jersey State Dental Society, Asbury Park, N. J., July 15, 16, 17, 1908.

New York State Dental Society, Albany, May 7, 8, 9, 1908.

North Dakota Dental Association, Devils Lake, N. D., May 12, 13, 14, 1908.

Northern Ohio Dental Association, Canton, Ohio, May 26, 27, 28, 1908.

Ohio State Dental Society, December, 1908.

Pennsylvania State Dental Society, Philadelphia, Pa., June 30, July 1, 2, 1908.

South Dakota Dental Society, Lead, S. D., July 22, 23, 1908.

Southern Illinois Dental Society, Greenville, Ill., October 27, 1908.

Southwestern Michigan Dental Society, Jackson Society, Jackson, Mich., April 14, 15, 1908.

Texas State Dental Association, Dallas, Texas, June 11, 12, 13, 1908.

Vermont State Dental Society, Montpelier, Vt., May 20, 22, 1908.

Wisconsin State Dental Society, LaCrosse, Wis., July 16, 17, 18, 1908.

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### National Dental Association.

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The twelfth annual meeting of this association will convene at Boston, Mass., July 28-31, 1908, inclusive.

Hotel Somerset has been selected by the Local Committee of Arrangements as headquarters of the association. The general and section meetings will be held here; also the exhibit and display.



Clinics will be given at Tuft's Medical and Dental School, on Huntington Avenue, a short distance from the hotel.

Hotel Somerset is situated on Commonwealth Avenue, at Fenway entrance to the Park System, and the sessions will be held in the large ballroom of this beautiful hotel.

Rates, European plan, are as follows:

\$4.00 per day for two in a room with bath.

3.00 per day for one in a room with bath.

3.50 per day for two in a room without bath.

2.50 per day for one in a room without bath.

Secure rooms in advance either by wire or letter to the management, or to the chairman and secretary of the Local Committee of Arrangements.

The Local Committee of Arrangements has features planning for the interest and entertainment of the delegates and visiting ladies, and it is confidently predicted that this meeting will surpass those of previous years. This is the wish of those having same in charge.

Membership in the association is limited to delegates from state societies, yet a most cordial invitation is extended to all reputable practitioners to attend this convention.

WALDO E. BOARDMAN, Chairman.

FRANK F. TAYLOR, Secretary.

419 Boylston Street, Boston, Mass.

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### New York State Dental Society.

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The fortieth annual meeting of the society will be held in Albany, May 7, 8 and 9, 1908. The following programme will be presented:

President's address, Dr. W. S. Rose.

Report of the correspondent, Dr. H. C. Ferris.

Report of the Committee on Practice, Dr. W. B. Dunning.

Report of the Committee on Scientific Research, Dr. L. M. Waugh.

Essayists: Dr. Truman W. Brophy, Dr. J. Bethune Stein, Dr. A. W. Harlan, Dr. Joseph Head, Dr. Charles R. Turner, Dr. G. W. Clapp, Dr. Herman Prinz.

There will be a dinner on Friday evening, May 8, to celebrate the fortieth anniversary, at which the guest of honor will be Governor Hughes.

Sessions will be held in Odd Fellows Hall, and ample space will



be provided for exhibitors, clinicians, etc. A cordial invitation is extended to all reputable members of the profession to attend.

The entire day of Saturday, May 9, will be devoted to clinics.

The trunk line association rate of one and one-third fares will be available for all obtaining certificates at time of purchasing ticket.

ELLISON HILLYER, Secretary.

Brooklyn, N. Y.

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### **Virginia State Dental Association.**

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The thirty-ninth annual session of the Virginia State Dental Association will be held at the Main Hall of the Medical College of Virginia, Richmond, Va., beginning July 14, 1908.

The intention of the society is to make this the most successful meeting in the history of the organization. Clinics will be given and papers read by eminent members of the profession.

All ethical practitioners are cordially invited to attend.

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### **South Western Michigan Dental Society.**

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Owing to change in arrangements the meeting of the South Western Michigan Dental Society, April 14-15, will be held at Grand Rapids instead of at Jackson.

Every effort is being made to make the meeting a success, and your patronage is desired.

C. W. JOHNSON, Secretary.

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### **California State Dental Association.**

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The California State Dental Association will hold its annual session in San Francisco, June 9, 10, 11, 1908.

At least two prominent clinicians are expected from the East; also larger and better exhibits than ever before.

C. E. POST, Secretary.



## Colorado State Dental Association.

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The twenty-second annual meeting of the Colorado State Dental Association will be held at Boulder, June 18, 19, and 20, 1908.

A cordial invitation is extended to all ethical practitioners to attend and take part in the proceedings.

CHAS. A. MONROE, Secretary.

1 Willard Blk., Boulder, Colo.

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## Interstate Dental Fraternity.

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The Board of Governors of the Interstate Dental Fraternity will convene for the annual business meeting of the order in Boston at The Brunswick, Boylston Street, July 24. The annual banquet will occur during the week and due notice thereof will be sent to the members as soon as arrangements can be made and the exact date fixed. It is hoped that the fraternity will meet in large numbers on this occasion.

DR. R. M. SANGER, National Secretary.

East Orange, N. J.

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## Seventh District Dental Society of the State of New York.

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The fortieth annual meeting of the Seventh District Dental Society of the State of New York will be held at the Powers Hotel, Rochester, Tuesday and Wednesday, March 31 and April 1, 1908.

It is expected this will be one of the best meetings in the history of the society. The second day will be devoted to clinics; this will be an eminently practical meeting. The latest and best in dentistry will be in evidence. Inlay methods and appliances will be a feature. There will be an exhibition of manufacturers.

W.M. W. BELCHER,  
B. S. HERT,  
W. W. SMITH,  
Business Committee.



## Indiana State Dental Association Semi-Centennial Jubilee Meeting.

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The Indiana State Dental Association will celebrate its fiftieth anniversary, June 4, 5, 6, at Indianapolis, with one of the largest meetings ever held.

The State associations of Michigan, Ohio, Kentucky and Illinois have accepted invitations to meet with us.

There will be five essayists: Drs. G. V. Black, Illinois; T. W. Brophy, Illinois; Charles Zederbaum, Michigan; M. H. Fletcher, Ohio; H. B. Holmes, Kentucky.

There will be fifty clinicians from these four States and practically all other State associations will be represented by clinicians.

All ethical dentists are invited, as this will be the big meeting of the year.

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## Pennsylvania State Dental Society.

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The fortieth annual meeting of the Pennsylvania State Dental Society will be held at the Bellevue Stratford Hotel, Philadelphia, Pa., on June 30, July 1 and 2, 1908, and it is the intention of every officer and committeeman of this society to make this anniversary the best of its kind in the dental history of the State.

To insure the success so earnestly desired we must have a list of clinicians whose operations are a guarantee of quality; therefore, it gives me pleasure to extend invitations to be with us and take an active part in the clinics.

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## South Dakota Dental Society.

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The twenty-sixth annual meeting of the South Dakota Dental Society will be held at Lead, S. Dak., July 22 and 23.

As this is the first meeting held in the Black Hills for nearly ten years, and owing to the excellent railroad facilities which we now have, a large attendance is expected from the entire State and from neighboring States.

FERDINAND BROWN, Secretary.



## **European Orthodontia Society.**

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The second annual meeting of the European Orthodontia Society will be held in Berlin, October 2 and 3. All those who are interested in the advancement of orthodontia are invited to attend.

DR. WILLIAM G. LAW, President.  
DR. LEE A. WATLING, Secretary.

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## **Missouri State Dental Association.**

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The forty-third annual meeting of the Missouri State Dental Association will convene in St. Louis, June 1, 2, 3, 1908, at the Planters' Hotel. Rates, \$1.50 and up per day. Efforts are being made to make this the most successful meeting in the history of the association. Distinguished members of the profession from out of the State will be present. All ethical members of the profession are cordially invited to come.

O. J. FRUTH,  
J. F. AUSTIN,  
P. H. MORRISON,  
Executive Committee, St. Louis, Mo.  
J. W. HULL, President, Kansas City, Mo.  
E. P. DAMERON, Corresponding Secretary, St. Louis, Mo.

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## **St. Louis Dental College Alumni Association.**

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The Alumni Association of the St. Louis Dental College wish to announce that their annual clinic will be held at the college building (Grand and Caroline Streets), Tuesday and Wednesday, May 19 and 20, 1908.

A good programme is being arranged and all graduates of the college are respectfully requested to be present and aid in making this meeting a success.

W. M. COLLINS,  
T. F. FLEMING,  
Committee on Publicity.



## **Northern Ohio Dental Association.**

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The fifty-first annual meeting of the Northern Ohio Dental Association will be held at Canton, Ohio, May 26, 27 and 28, 1908.

The sessions will be held in the city's auditorium, one of the largest in the Middle West, with headquarters at the Courtland Hotel. There are numerous other hotels in Canton, so there will be accommodation for all. Hotel rates may be had at from \$1.50 to \$5.00 per day, American plan.

Canton is essentially a dental manufacturing town, having three large and busy plants. The exhibits will be first class.

The committees are sparing no time or expense to make this an especially attractive meeting. The programme will be up to the standard of previous years. Men of international reputation have been secured to read papers and clinics.

Remember the time and place, May 26, 27, 28, 1908, Canton, Ohio.

W. H. WHITSLAR,  
J. H. WIBLE,  
F. M. CASTO, Chairman,  
Executive Committee.

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## **Georgia State Dental Society.**

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The next meeting of the Georgia State Dental Society will be held at White Sulphur Springs, June 9, 10 and 11, 1908. All ethical practitioners are cordially invited.

D. H. MCNEILL, Corresponding Secretary.

Athens, Ga.

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## **Southern Illinois Dental Society.**

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The Southern Illinois Dental Society will hold its next session in Greenville, Ill., the fourth Tuesday in October, 1908.

HARRY K. BARNETT, Secretary.

Upper Alton, Ill.



## **Vermont State Dental Society.**

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The thirty-second annual meeting of the Vermont State Dental Society will be held at the Hotel Pavilion, Montpelier, Vt., May 20 to 22, 1908.

Preparations are being made for an excellent programme, and members of the dental profession are cordially invited.

THOMAS MOUND, Secretary,

C. H. KENT, President,

Rutland, Vt.

Barre, Vt.

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## **Texas State Dental Association.**

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The next annual meeting of the Texas State Dental Association will be held at Dallas, June 11, 12 and 13, 1908.

Visitors from other States are cordially invited to attend.

J. G. FIFE, Secretary.

Dallas, Tex.

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## **Maryland State Dental Association.**

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The thirteenth annual union meeting of the Maryland State Dental Association and the District of Columbia Dental Society will be held in Baltimore, Md., June 4, 5 and 6, 1908, at the Dental Department of the University of Maryland.

Special effort will be exerted to make this meeting a great success. Clinics will be given and important papers read by eminent members of the profession, and a cordial invitation is extended to all ethical practitioners to attend and take part in the proceedings.

F. F. DREW, Cor. Secretary.

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## **Nebraska State Dental Society.**

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The thirty-second annual meeting of the Nebraska State Dental Society will meet in Omaha, May 19, 20 and 21, 1908, at the Creighton Dental College. All reputable members of the dental profession are cordially invited to attend.

E. H. BRUENING, Secretary.



## Texas State Board of Dental Examiners.

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The regular semi-annual meeting of the Texas State Board of Dental Examiners will be held in Dallas, beginning 9 a. m., Monday, June 15, 1908.

No interchange of license with any other State.

No special examination to practitioner already in practice.

Application accompanied by fee—\$25.00—should be filed with secretary by June 10th.

For further information address

BUSH JONES, Secretary.

Dallas, Texas.

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## The Illinois State Board of Dental Examiners.

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The next regular meeting of the Illinois State Board of Dental Examiners for the examination of applicants for a license to practice dentistry in the State of Illinois will be held in Chicago at the Northwestern University Dental School, southeast corner of Lake and Dearborn Streets, beginning Thursday, June 4, 1908, at 9 a. m.

Applicants must be in possession of the following requirements in order to be eligible to take the examination: (1) Any person who has been engaged in the actual, legal and lawful practice of dentistry or dental surgery in some other state or country for five consecutive years just prior to application; or (2) is a graduate of and has a diploma from the faculty of a reputable dental college, school or dental department of a reputable university; or (3) is a graduate of and has a diploma from the faculty of a reputable medical college or medical department of a reputable university, and possesses the necessary qualifications prescribed by the board.

Candidates will be furnished with proper blanks and such other information as is necessary on application to the secretary. All applications must be filed with the secretary five days prior to the date of examination. The examination fee is twenty (\$20) dollars, with the additional fee of five (\$5) dollars for a license.

Address all communications to

J. G. REID, Secretary,  
1204 Trude Bldg., Chicago, Ill.



## **Florida State Dental Society.**

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The twenty-fifth annual meeting of the Florida State Dental Society will be held at Tampa, Thursday, May 21, continuing in session three days.

All ethical members of the dental profession cordially invited to be present.

CARROLL H. FRINK, D.D.S., Cor. Sec.

Fernandina, Fla.

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## **Fifth District Dental Society of New York.**

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The Fifth District Dental Society of New York will meet at the Hotel Yates, in Syracuse, on April 24 and 25.

R. W. BARRY, Secretary.

Oswego, N. Y.

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## **New Hampshire Dental Society.**

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The thirty-first annual meeting of the New Hampshire Dental Society will be held at the Cheshire House, Keene, N. H., May 12, 13 and 14, 1908. A good programme is being prepared and all reputable members of the dental profession are cordially invited to attend.

J. H. WORTHEN, President,  
Concord, N. H.

F. F. FISHER, Seretary,  
Manchester, N. H.

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## **West Virginia State Board of Dental Examiners.**

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The next meeting of the West Virginia State Board of Dental Examiners will be held at Huntington, June 10, 11, 12, 1908. All applications, together with the fee of \$25, should be sent to the secretary not later than June 5th.

Blanks, etc., can be obtained from

Charleston, W. Va.

J. F. BUTTS, Secretary.



## Tennessee Board of Dental Examiners.

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The Tennessee Board of Dental Examiners will hold its annual meeting in Nashville, Tenn., on May 16-19, 1908.

In accordance with the provisions of the recently amended dental law all applicants for registration *must present diplomas* from reputable dental colleges, pass a written examination by the State Board, and give a practical demonstration of proficiency in operative and prosthetic dentistry, making an average of at least 75 per cent. in all branches taught in dental colleges prior to registration.

Applicants for examination must make application to the secretary-treasurer at least ten days before meeting of board. Examination fee \$10.

F. A. SHOTWELL, Secretary-Treasurer.

Rogersville, Tenn.

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## Maryland Board of Dental Examiners.

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The Maryland Board of Dental Examiners will meet for examination of candidates for certificates, May 14-15, 1908, at the Dental Department of the Baltimore Medical College, Baltimore, at 9 a. m.

Applicants must pass a written examination in anatomy and physiology, chemistry and bacteriology, operative and mechanical dentistry, oral surgery and pathology, therapeutics and *materia medica*. Must insert a gold filling in the mouth and submit a plate or bridge of not less than four crowns, the parts being assembled and invested in advance and soldered in the presence of the board.

Application blanks properly filled out, accompanied by the fee of ten (\$10) dollars, must be filed with the secretary prior to May 14.

F. F. DREW, Secretary.

701 N. Howard Street, Baltimore, Md.

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## Kansas State Board of Dental Examiners.

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The next meeting for examination of applicants for registration will be held in Topeka, May 13, 14, 15 and 16.

The first session will begin the evening of the 13th at 7.30 o'clock. A graduate of a reputable college is not required to take an examination.



The fee is twenty-five dollars (\$25).

The examination will be practical and theoretical. Those taking the examination will be expected to furnish all instruments except a vulcanizer.

Any one expecting to take the examination please write the secretary for complete information.

The Copeland Hotel will be headquarters.

F. O. HETRICK.

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### Florida State Board of Dental Examiners.

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The annual meeting of the Florida State Board of Dental Examiners for the examination of candidates will be held in Tampa, Fla., May 18, 19, 20, 1908.

Candidates who wish to take examination will report to secretary, 215 American National Bank Building, at 9 o'clock on the morning of the 18th and exhibit diploma. Only those who are graduates from reputable dental schools will be admitted to examination.

Candidates must be prepared with instruments to show their skill in operative dentistry, and in the prophylactic treatment of gums and teeth. So far as possible patients will be furnished. The board in every instance selects cavity to be filled. Each applicant will be required to solder and finish four-tooth bridge.

The theoretic examination—written—will include operative dentistry, prosthetic dentistry, crown and bridge work, orthodontia, anatomy, physiology, bacteriology, pathology, therapeutics, material medica, chemistry, oral surgery, histology, metallurgy and oral hygiene.

Candidates must furnish photograph, which will be made part of the secretary's record.

W. G. MASON, Secretary of Board.

Tampa, Fla.